C21.5 979/1

Vol. 979 Number 1

OFFICIAL GAZETTE

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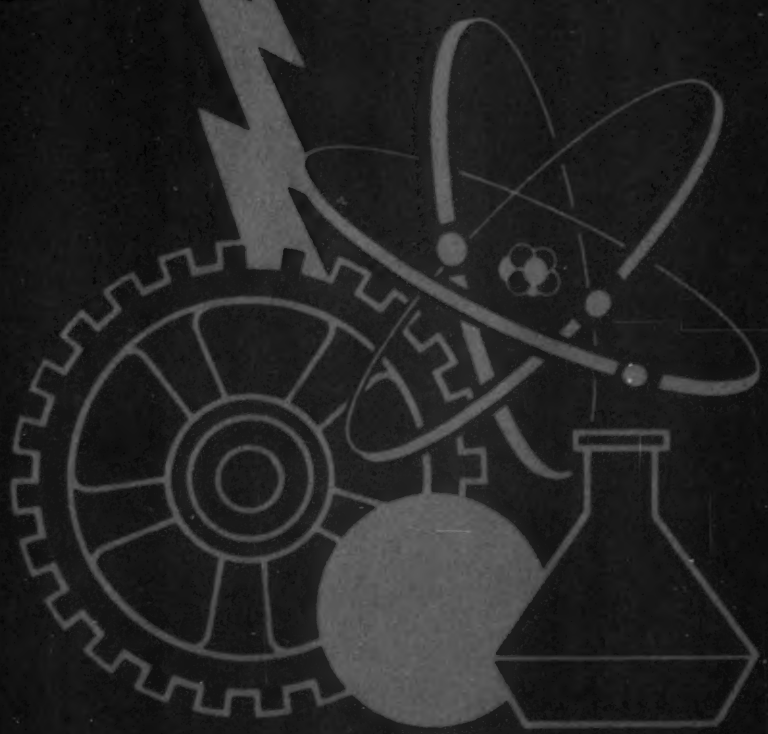

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

February 6, 1979 Volume 979 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT): Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER.
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

National Inventors Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 10, from 1:00 p.m. to 5:00 p.m. and Sunday, February 11, 1979 from 10:30 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the dedication of the National Inventors Hall of Fame and the induction of four inventors into the Hall of Fame at 1:00 p.m. on Sunday, February 11.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 9, 1979.

We would appreciate the cooperation of all users of the Search Room facilities by removing all personal properties and items for the early closing.

LUTRELLE F. PARKER,
For DONALD W. BANNER,
Dec. 7, 1978. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,947,075, Schneckenburger and Kung, METHOD FOR THE CONTINUOUS CASTING OF METAL STRIP, AND STRIP CASTING PLANT FOR CARRYING OUT THE METHOD, **filed** Oct. 28, 1975, D.C., W.D. Pa. (Pittsburgh), Doc. 75–1379, *Concast, Inc.* v. *Rokop Corporation, doing business as Rokop Engineering Corporation.* Patent has been infringed by defendant, June 15, 1977.

3,255,800, Strang and Swanson, TIRE CHANGING STAND; **3,255,801,** R. C. Tabordon, POWER OPERATED TIRE CHANGING STAND; **D. 243,551,** Wood and Cunningham, TIRE CHANGING APPARATUS OR SIMILAR ARTICLE, **filed** Mar. 23, 1978, D.C., S.D. Iowa (Des Moines), Doc. 78–76–1, *Vulcan Equipment Company, Limited* v. *The Coats Company.*

3,255,801. (See 3,255,800.)

3,290,841, M. A. Sartore, APPARATUS FOR NETTING MEAT AND MEAT PRODUCTS; **3,477,860,** same, METHOD FOR NETTING MEAT, **filed** Mar. 10, 1978, D.C.N.J. (Newark), Doc. 78–475, *Jetnet Corporation* v. *Bendler Knitting Corp.* Order of dismissal, Sept. 6, 1978.

3,299,535, Stull and Ferguson, FRICTIONLESS TRACK AND GLIDERS HAVING AIR BEARING SURFACES FOR DEMONSTRATING MECHANICAL PRINCIPLES, **filed** May 18, 1977, D.C. Mass. (Boston), Doc. CA77–1423–T, *The Ealing Corporation* v. *Daedalon Corporation.* Consent decree upon stipulation, Aug. 30, 1978.

3,196,349, C. F. Bloodgood, LAMP FIXTURE, Sept. 28, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78–C–624, *Dennis G. Moore and George R. Moore et al.* v. *Wesbar Corporation et al.*

3,139,490, P. D. Lyons, SOUND REPRODUCING AND RECORDING DEVICE, Oct. 10, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c4006, *Philip D. Lyons* v. *Nippon Gakki Seizo Kabushiki Kaisha.*

3,147,853, R. L. Van Huis, CORNER POST ASSEMBLY; **3,185,289,** Kurtz and Graves, BELT CONVEYOR AND SAFETY MECHANISM THEREFOR; **3,707,141,** Boer and Van Huis, CAPSTAN CABLE DRIVE; **3,768,442,** R. L. Van Huis, MULTITIER CAGE CONSTRUCTION; **Re. 27,035,** R. L. Van Huis, FEED SAVER FOR AUTOMATIC FEED APPARATUS, **filed** June 17, 1977, D.C., E.D. Pa. (Philadelphia), Doc. 77–2143, *Big Dutchman Division of U.S. Industries, Inc.* v. *Favorite Manufacturing Inc.*

3,185,289. (See 3,147,853.)

3,192,198, Nayler and Smith, PENICILLINS; **Re. 28,744,** Long and Nayler, CRYSTALLINE P-HYDROXYAMPICILLIN AND SALT THEREFOR, **filed** Oct. 3, 1978, D.C. Del. (Wilmington), Doc. 78–407, *Beecham Limited* v. *American Home Products Corporation.*

3,219,276, E. O. Norris, PLURAL NOZZLES HAVING INTERSECTING SPRAY AND CONTROL THEREFOR; **3,301,488,** same, SPRAY GUN, **filed** June 6, 1972, D.C. Conn. (New Haven), Doc. 15087, *Champion Spark Plug Co.* v. *The Gyromat Corporation.* It is ordered and adjudged that judgment be and is hereby entered in favor of the plaintiff, Oct. 18, 1978.

3,276,784, H. M. Anderson, Jr., LAMINATED SKI HAVING A FOAM FILLED HONEYCOMB CORE, **filed** Oct. 2, 1978, D.C., N.D. Ohio (Toledo), Doc. C–78–456, *Henry M. Anderson, Jr.* v. *Sears, Roebuck and Company.*

3,301,488. (See 3,219,276.)

3,332,617, Higonnet and Moyroud, TYPE COMPOSING APPARATUS, **filed** Nov. 21, 1975, D.C., N.D. Calif. (San Francisco), Doc. 2455, *Automix Keyboards, Inc.* v. *Dymo Industries, Inc.* Action dismissed, Sept. 21, 1978.

3,333,198, Mandell and Brownstein, TELEVISION CONVERTER, **filed** Oct. 18, 1978, D.C., E.D. Pa. (Philadelphia), Doc. 78–3478, *Oak Industries, Inc.* v. *Jerrold Electronics Corporation.* **Same, filed** Feb. 16, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c578, *Oak Industries Inc.* v. *General Instrument Corporation.* Defendant's motion to dismiss for improper venue is granted, Sept. 27, 1978. **Same, filed** Apr. 13, 1978, D.C. Colo. (Denver), Doc. 78–W–398, *Teleprompter Corporation* v. *Athena Cablevision Corporation.*

3,334,877, F. M. Payne, HUMIDIFIER UNIT FOR AIR DUCTS OF WARM AIR FURNACES, **filed** Sept. 28, 1978, D.C. Md. (Baltimore), Doc. Y78–1858, *The Spra-Kleen Company, Inc.* v. *MacKagen Associates, Inc.*

3,340,800, Gruver, Seifried and Johnson, DUAL ROLLER PLATENS IN ADDRESS PRINTING MACHINE, **filed** Sept. 11, 1978, D.C., S.D.N.Y., Doc. 78–C–4266, *Addressograph-Multigraph Corp.* v. *Bartizan Corp.*

3,372,958, R. R. Black, AUTOMATIC FEEDER FOR PNEUMATIC CONVEYING LINES, **filed** Feb. 8, 1978, D.C., W.D. Wash. (Seattle), Doc. C78–95–V, *Cyclonaire Corporation* v. *Airkonvey, Inc.* Stipulation of dismissal and judgment of dismissal, filed and entered Sept. 11, 1978.

3,378,437, Arndt and Steinhausen, ACARICIDAL AGENTS; **3,502,720,** same, N-2-Methyl-4-Chloraphenyl- Formamidines, **filed** July 12, 1978, D.C. Ariz. (Phoenix), Doc. C78–562–PhX WEC, *Schering, A.G. Berlin/Bergkamen* v. *Crop Development, Inc.* Plaintiff filed notice of voluntary dismissal, Sept. 22, 1978.

3,379,889, Barnett and Barnett, BEAM-DRIVEN GYROSCOPE DEVICE, **filed** Oct. 12, 1978, United States Court of Claims (Washington, D.C.), *Eugene R. Barnett and Willard L. Barnett* v. *The United States.*

3,502,720. (See 3,378,437.)

3,351,836, R. W. Kearns, WINDSHIELD WIPER SYSTEM WITH INTERMITTENT OPERATION; **3,564,374,** same, INTERMITTENT CONTROL DEVICE; **3,581,178,** same, WINDSHIELD WIPER CONTROL DEVICE; **3,582,747,** same, INTERMITTENT WINDSHIELD WIPER SYSTEM WITH ELECTRODYNAMIC BRAKING; **3,593,090,** same, INTERMITTENT WINDSHIELD WIPER CONTROL; **3,602,790,** same, INTERMITTENT WINDSHIELD WIPER SYSTEM; **3,706,036,** same, WINDSHIELD WIPER CONTROL DEVICE, **filed** Mar. 21, 1978, D.C., E.D. Mich. (Detroit), Doc. 78–70642, *Robert W. Kearns* v. *Woods Motors, Inc. et al.* **Same, filed** May 17, 1978, D.C. Md. (Baltimore), Doc. B–78–882, *SWF-Specialfabrik fur Autozubehor Gustav Rau G.m.b.H.* v. *Robert W. Kearns.*

3,107,836, C. W. Van't Veld, PAPER FORM GUIDE, filed Nov. 19, 1976, D.C. (District of Columbia), Doc. 76-2152, *Cecil W. Van't Veld v. Honeywell, Inc.* Opinion and order filed Nov. 30, 1977.

3,424,189, J. C. Woodford, SELF-DRAINING SILL COCK AND VACUUM BREAKER; **D. 216,791**, same, WALL HYDRANT, filed Oct. 28, 1977, D.C., N.D. Ohio (Cleveland), Doc. C77-1137, *Josam Manufacturing Co. v. Woodford Manufacturing Company.*

3,446,831, Magell and Bolten, ESTERS OF 1,1,3,3-TETRAMETHYLBUTYL HYDROPEROXIDE; **3,624,123**, Lewis and Friedman, ALKYL PERESTERS OF HYDROPEROXIDES; **3,687,867**, Lewis and Pinole, NOVEL CO-INITIATOR SYSTEMS; **3,726,847**, Lewis and Friedman, POLYMERIZATION METHOD EMPLOYING ALKYL PERESTERS OF HYDROPEROXIDES; **3,763,128**, Lewis and Friedman, NOVEL CO-INITIATOR SYSTEM, filed May 1, 1972, D.C., S.D. Tex. (Houston), Doc. 72-H-570, *Argus Chemical Corporation v. Pennwalt Corporation.* The counterclaims asserted by plaintiff, Argus Chemical Corporation, and by defendant, Pennwalt Corporation, are dismissed with prejudice, Dec. 11, 1973.

3,454,226, K. Nielsen, ATOMIZER WHEEL FOR THE ATOMIZATION OF SUSPENSIONS OF HARD-WEARING MATERIALS; **Re. 29,083**, same, filed Sept. 27, 1977, D.C., M.D. La. (Baton Rouge), Doc. 77-386, *Aktieselskabet Niro Atomizer v. Ciba-Geigy Corporation.*

3,477,860. (See 3,290,841.)

3,484,900, Sands and Broome, TUBING AND PIPING OF THERMOPLASTICS MATERIAL, filed Apr. 13, 1976, D.C. (District of Columbia), Doc. 76-0613, *Robintech, Inc. v. Wavin Plastics Ltd.* Denying plaintiff's counterclaim for alleged failure to furnish certain information; dismissing action, May 10, 1978.

3,526,415, A. Freundlich, HELICAL WIRE BOUND NOTEBOOK AND HELICAL BINDING THEREFOR; **3,568,729**, Freundlich and Diakoff, DEVICES FOR CLIPPING AND LOOPING ENDS OF HELICAL BINDERS, filed Aug. 2, 1978, D.C., N.D. Tex. (Dallas), Doc. CA3-78-0948-D, *Bielomatik Leuze & Co. v. Southwest Tablet Manufacturing Company and E.C.H. Will.* Same, filed Aug. 11, 1978, D.C., S.D.N.Y., Doc. 78-C-3738 VLB, *E.C.H. Will (GmbH & Co.) v. Freundlich-Gomez Machinery Corp.*

3,564,874. (See 3,351,836.)

3,568,729. (See 3,526,415.)

3,581,178. (See 3,351,836.)

3,582,747. (See 3,351,836.)

3,586,799, F. W. Murphy, MULTIPLE CONTACT GAUGE WITH ADJUSTABLE SELECTIVE CONTACT ARMS, filed Oct. 20, 1978, D.C., N.D. Tex. (Dallas), Doc. CA-3-78-1295-C, *Frank W. Murphy Manufacturer, Inc. v. Controltronics, Inc.*

3,593,000. (See 3,351,836.)

3,602,790. (See 3,351,836.)

3,613,264, Vitka and Framingham, WAVE CELL, filed Oct. 5, 1978, D.C., E.D. Mich. (Detroit), Doc. 78-72548, *Motionetics, Inc. v. Gary Timco, doing business as Bachelor of Arts and Timco Products, Inc.*

3,624,123. (See 3,446,831.)

3,687,867. (See 3,446,831.)

3,690,495, L. S. Turner, SECURITY CLOSURE FOR A SCREW TYPE CONTAINER, filed Oct. 18, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c4109, *Lloyd S. Turner v. Montgomery Ward.*

3,707,141. (See 3,147,853.)

3,724,897, Faiks and Buhk, WIRE ROD CHAIR, filed Oct. 18, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-666, *Steelcase, Inc. v. Krueger, Inc.*

3,726,847. (See 3,446,831.)

3,763,128. (See 3,446,831.)

3,768,442. (See 3,147,853.)

3,772,132, G. N. Dulin, Jr., FLOCKED FABRIC AND METHOD FOR MAKING SAME, filed May 17, 1977, D.C., S.D.N.Y., Doc. 77-C-2434 VLB, *Malden Mills, Inc. v. Flock Industries, Inc.* This dismissal is without prejudice, Oct. 23, 1978.

3,796,936. (See 3,351,836.)

3,825,115, Black and Bennett, COIN ROLL PICK-UP CONVEYOR; same, **3,860,017**, COIN CIRCULATING FEED CONVEYOR, filed Oct. 17, 1978, D.C., N.D. Tex. (Dallas), Doc. CA3-78-1284-C *Universal Machine Company, Inc. v. Hiendrich Bierline and Global Geldzahlmaschinen, G.m.b.H.*

3,860,017. (See 3,825,115.)

3,895,738, Buchanan, Krone, Krone, and Noyes, GASOLINE DISPENSING SYSTEM, filed Sept. 29, 1978, D.C., N.D. Okla. (Tulsa), Doc. 78-C-484-B, *Dataq, Inc. v. Tokheim Corporation.*

3,910,434, Ebeling and Ebeling, MECHANICALLY ACTUATED SIDE LOADING ARRANGEMENT FOR A VEHICLE BODY, filed Oct. 12, 1978, D.C. Ariz. (Phoenix), Doc. 78-783-PhX WPC, *Franklin D. Ebeling, Ernest C. Ebeling and Ebeling Manufacturing Corporation v. Litter-Lift Systems, Inc. and Maxon Industries, Inc.*

3,913,971, H. Green, DETACHABLE SUN ROOF PANEL FOR AUTOMOBILES; **3,965,566**, same, METHOD OF INSTALLING DETACHABLE SUN ROOF PANEL FOR AUTOMOBILES; **4,067,605**, Green and Hewson, DETACHABLE SUN ROOF PANEL FOR AUTOMOBILES, filed Feb. 3, 1978, D.C., E.D. Mich. (Detroit), Doc. 78-70246, *Empire Automotive, Inc. and Louise E. Hugh v. Wisco Corp. et al.*

3,956,566. (See 3,913,971.)

4,067,605. (See 3,913,971.)

4,069,641, T. M. DeZutter, STORM WINDOW FRAMING, filed Oct. 19, 1978, D.C., N.D. Tex. (Dallas), Doc. CA-3-78-1292-F, *K-S-H Inc. v. Bast Industries Inc.*

4,088,025, Foster, Comiskey and Degner, MATERIAL SAMPLING APPARATUS, filed Oct. 2, 1978, D.C. Nebr. (Omaha), Doc. 78-0-429, *Elevator Contractors, Inc. v. International Stanley Corporation.*

Re. 27,035. (See 3,147,853.)

Re. 28,404, R. W. McFarlin, CONTINUOUS ELECTRICAL OUTLET WITH GROUND, filed June 1, 1977, D.C., S.D. Fla. (Miami), Doc. 77-6251-C-JLK, *Robert W. McFarlin, et al. v. J. M. Fields, Inc.* Plaintiff's and defendant settled by mutual agreement matter of damages, June 2, 1977.

Re. 28,744. (See 3,192,198.)

Re. 29,050, L. Z. Hakim, TOY WITH SOUND PRODUCING MEANS, filed Oct. 10, 1978, D.C.N.J. (Newark), Doc. C-78-2446, *Louise Z. Hakim v. Childhood Interests/Alan Jay, Inc.*

Re. 29,083. (See 3,454,226.)

D. 216,790. (See 3,424,189.)

D. 216,791. (See 3,424,189.)

D. 220,911, C. McGrady, TRANSPARENT BOOK STAND, filed May 30, 1978, D.C. Colo. (Denver), Doc. 78-M-549, *Aspenglas Corporation v. Corinne McGrady, doing business as McGrady Designs.*

D. 227,365. (See 3,424,189.)

D. 227,366. (See 3,424,189.)

D. 227,722, M. A. Mendlin, COMBINED BED AND STORAGE UNIT; **D. 227,723**, same; **D. 227,725**, same, filed June 7, 1977, D.C.N.J. (Newark), Doc. C-77-1106, *Bunk Trunk Distributors v. Unique Headboard Company, Inc.* Order dismissing the action, Jan. 25, 1978.

D. 227,723. (See D. 227,722.)

D. 227,725. (See D. 227,722.)

D. 238,268, C. Strada, MOTORCYCLE EXHAUST PIPE, filed May 2, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c1793, *Harley-Davidson v. Charles Strada.*

D. 240,819, W. Macowski, DESK CADDY, filed Apr. 25, 1978, D.C., S.D.N.Y., Doc. 78-C-1886 (JMC), *Ketcham & McDougall, Inc. v. Davor Products Importers.* Judgment by consent, May 25, 1978.

D. 241,827, R. Podall, SPLASH GUARD FOR MOTOR VEHICLES, filed Dec. 8, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c4504, *Custom Accessories, Inc. v. Jeffrey Allan Industries, Inc.* Defendants counterclaim is dismissed, Sept. 14, 1978.

D. 243,551. (See 3,255,800.)

D. 247,995, D. P. Lage, KEY RING, filed Sept. 15, 1978, D.C., E.D.N.Y. (Brooklyn), Doc. 78-C-2071, *Quick Point, Inc. v. Ever-Lite Company, Inc.*

D. 249,754, S. P. Nash, CHAIR OR SIMILAR ARTICLE, filed Oct. 4, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-C-638, *Schweiger Industries, Inc. v. Sears, Roebuck and Co.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,769,032, Re. S.N. 967,045, Filed Dec. 6, 1978, Cl. 426/594, AROMA-ENRICHED COFFEE PRODUCTS AND PROCESS, Timothy A. Lubsen, et al., Owner of Record: *The Procter & Gamble Company, Cincinnati, Ohio,* Attorney or Agent: Richard A. Witte, et al., Ex. Gp.: 172

3,859,215, Re. S.N. 960,263, Filed Nov. 13, 1978, Cl. 210/170, SEWAGE TREATMENT SYSTEM, George A. Milne, Owner of Record: *Inventor,* Attorney or Agent: James C. Wray, Ex. Gp.: 176

3,982,446, Re. S.N. 947,707, Filed Sep. 29, 1978, Cl. 74/488, CRUISE CONTROL APPARATUS FOR HAND GRIP THROTTLE CONTROL, Andrew Van Dyken, Owner of Record: *Inventor,* Attorney or Agent: John E. McGarry, et al., Ex. Gp.: 345

3,994,415, Re. S.N. 964,118, Filed Nov. 28, 1978, Cl. 220/331, TRASH CONTAINER LID SYSTEM, Allan M. Hodge, Owner of Record: *Inventor,* Attorney or Agent: A. C. Rose, et al., Ex. Gp.: 241

3,997,134, Re. S.N. 967,212, Filed Dec. 7, 1978, Cl. 244/110 B, FUSELAGE TAIL JET ENGINE THRUST REVERSER, George T. Drakeley, Owner of Record: *The Boeing Company, Seattle, Wash.,* Attorney or Agent: Robert W. Beach, et al., Ex. Gp.: 315

3,997,853, Re. S.N. 967,172, Filed Dec. 6, 1978, Cl. 331/94.5 F, CHROMIUM-DOPED BERYLLIUM ALUMINATE LASERS, Carl A. Cline, et al., Owner of Record: *Allied Chemical Corporation, Morris Township, N.J.,* Attorney or Agent: Robert A. Harman, et al., Ex. Gp.: 254

4,020,661, Re. S.N. 943,541, Filed Sep. 18, 1978, Cl. 70/58, SKI LOCK APPARATUS, Edward L. Rich, Owner of Record: *Inventor,* Attorney or Agent: John F. Learman, et al., Ex. Gp.: 355

4,046,430, Re. S.N. 963,072, Filed Nov. 22, 1978, Cl. 308/26, DAMPED INTERSHAFT BEARING AND STABILIZER, Dennis F. Buono, et al., Owner of Record: *United Technologies Corporation, Hartford, Conn.,* Attorney or Agent: Norman Friedland, Ex. Gp.: 315

4,080,537, Re. S.N. 967,719, Filed Dec. 8, 1978, Cl. 290/38 R, REMOTE STARTING SYSTEM FOR A COMBUSTION ENGINE, Jeffry C. Bucher, Owner of Record: *Inventor,* Attorney or Agent: William E. Schuyler, et al., Ex. Gp.: 217

4,097,326, Re. S.N. 965,097, Filed Nov. 30, 1978, Cl. 156/366, POWER ACTUATED LAMINATING MACHINE, Joe D. Giulie, et al., Owner of Record: *General Binding Corporation, Northbrook, Ill.,* Attorney or Agent: J. Arthur Gross, et al., Ex. Gp.: 161

4,108,374, Re. S.N. 962,143, Filed Nov. 20, 1978, Cl. 237/1 A, HEAT STORAGE WATER TANK, Floyd A. Lyon, et al., Owner of Record: *Halm Instrument Co. Inc., Glen Head, N.Y.,* Attorney or Agent: James P. Malone, Ex. Gp.: 344

4,109,355, Re. S.N. 967,718, Filed Dec. 8, 1978, Cl. 28/151, WEAVING SYSTEM, METHOD OF WEAVING AND APPARATUS, Edward Davitian, Owner of Record: *Inventor,* Attorney or Agent: Robert E. Isner, et al., Ex. Gp.: 353

PATENT NOTICES

Certificates of Correction for the Week of Feb. 6, 1979

D. 248,590	4,094,653	4,103,053	4,118,078
3,781,932	4,094,746	4,103,086	4,118,080
3,799,650	4,094,959	4,103,173	4,118,236
3,911,158	4,095,516	4,103,312	4,118,348
3,944,612	4,095,762	4,103,612	4,118,356
3,947,491	4,095,886	4,104,078	4,118,525
3,951,743	4,096,108	4,104,088	4,118,767
3,974,525	4,096,188	4,104,128	4,118,776
3,976,804	4,096,949	4,104,500	4,118,812
3,982,518	4,097,224	4,105,052	4,119,078
4,006,692	4,097,559	4,105,076	4,119,087
4,018,913	4,097,594	4,105,216	4,119,114
4,018,915	4,097,760	4,105,465	4,119,184
4,030,837	4,097,811	4,105,622	4,119,185
4,031,191	4,097,953	4,105,639	4,119,193
4,031,814	4,098,038	4,105,736	4,119,333
4,033,287	4,098,118	4,105,824	4,119,345
4,034,200	4,098,136	4,105,901	4,119,497
4,035,369	4,098,170	4,105,934	4,119,520
4,037,949	4,098,324	4,106,438	4,119,599
4,038,201	4,098,613	4,106,483	4,119,685
4,040,830	4,098,614	4,106,488	4,119,778
4,041,717	4,098,792	4,106,534	4,119,994
4,044,968	4,098,804	4,106,791	4,120,300
4,045,534	4,099,254	4,106,814	4,120,397
4,046,997	4,099,361	4,106,976	4,120,486
4,048,328	4,099,691	4,107,298	4,120,514
4,048,846	4,099,812	4,107,567	4,120,555
4,054,567	4,099,849	4,107,585	4,120,644
4,055,329	4,100,051	4,112,533	4,120,658
4,058,477	4,100,090	4,112,556	4,120,671
4,059,732	4,100,123	4,113,349	4,120,795
4,061,046	4,100,230	4,113,549	4,120,833
4,066,752	4,100,273	4,113,649	4,120,888
4,067,259	4,100,281	4,113,703	4,121,206
4,067,769	4,100,346	4,113,773	4,121,694
4,075,172	4,100,665	4,113,784	4,121,791
4,075,212	4,100,766	4,114,273	4,121,883
4,077,351	4,100,916	4,114,418	4,121,922
4,077,577	4,101,140	4,114,785	4,122,043
4,079,787	4,101,343	4,114,879	4,122,193
4,081,726	4,101,563	4,115,251	4,122,255
4,082,106	4,101,723	4,115,321	4,122,323
4,082,877	4,101,803	4,115,344	4,122,350
4,086,577	4,102,092	4,115,448	4,122,461
4,087,953	4,102,257	4,115,462	4,122,498
4,088,496	4,102,297	4,115,609	4,122,614
4,089,038	4,102,434	4,116,074	4,122,641
4,091,123	4,102,447	4,116,246	4,122,933
4,091,663	4,102,521	4,116,500	4,123,548
4,092,313	4,102,629	4,117,064	4,124,810
4,093,381	4,102,770	4,117,717	
4,094,191	4,102,780	4,117,794	
4,094,279	4,102,831	4,117,905	

Disclaimers

3,713,864.—*Joseph Francis Ackerman*, Cedar Grove, *George Beerli*, Arlington, *Robert George Savageau*, Pompton Lakes, and *Joseph Weisfeld*, Fair Lawn, N.J. METHOD OF PRINTING OR COATING USING ACTINIC RADIATION SETTING OF APPLIED COATING AND COATED PRODUCT. Patent dated Jan. 30, 1973. Disclaimer filed Dec. 20, 1978, by the assignee, *Inmont Corporation*.

Hereby enters this disclaimer to claims 2–6 and 8 of said patent.

3,767,884.—*John M. Osepchuk*, Concord, and *James E. Simpson*, Waltham, Mass. ENERGY SEAL FOR HIGH FREQUENCY ENERGY APPARATUS. Patent dated Oct. 23, 1973. Disclaimer filed Dec. 7, 1978, by the assignee, *Raytheon Company*.

Hereby enters this disclaimer to claims 37, 38, 40, 41, 43, 45, 46, 51, 52 and 53 of said patent.

3,895,280.—*Neal D. Peterson*, North Easton, Mass. ELECTRONIC CONTROLLER WITH REMOTE TUNING. Patent dated July 15, 1975. Disclaimer filed Nov. 3, 1978, by the assignee, *The Foxboro Company*.

Hereby enters this disclaimer to all claims of said patent.

3,954,844.—*Frank B. Colton*, Evanston, and *Leland J. Chinn*, Morton Grove, Ill. (5Z,13E,15S)-15-HYDROXY-11-OXO-PROSTA-5,9,13-TRIEN-1-OIC ACID AND ESTERS. Patent dated May 4, 1976. Disclaimer filed Oct. 27, 1978, by the assignee, *G. D. Searle & Co.*

Hereby enters this disclaimer to claim 3 of said patent.

Dedications

3,076,713.—*Russell H. Maas*, Madison, Wis. PROCESSING MEAT. Patent dated Feb. 5, 1963. Dedication filed Nov. 2, 1978, by the assignee, *Oscar Mayer & Co., Inc.*

Hereby dedicates to the public the entire remaining term of said patent.

4,024,627.—*Larry Ronald Stauffer*, Camp Hill, Pa. PACKAGE MOUNTING OF ELECTRONIC CHIPS, SUCH AS LIGHT EMITTING DIODES. Patent dated May 24, 1977. Dedication filed Dec. 5, 1978, by the assignee, *AMP Incorporated*.

Hereby dedicates to the public the entire remaining term of said patent.

Patents Available for Licensing or Sale

3,490,026. DIPOLE ANTENNA WITH V-SHAPED DIRECTORS. Hans Kolbe & Co., Bad Salzdetfurth, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

3,699,452. ACTIVE ANTENNA ARRANGEMENT FOR A PLURALITY OF FREQUENCY RANGES. Hans Kolbe & Co., Bad Salzdetfurth, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

3,942,119. MULTIPLE-TRANSMISSION-CHANNEL ACTIVE ANTENNA ARRANGEMENT. Hans Kolbe & Co., Bad Salzdetfurth, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,070,677. WINDOW ANTENNA AND DEFROSTER WITH MEANS FOR REDUCING RADIO INTERFERENCE. Hans Kolbe & Co., Bad Salzdetfurth, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,101,115. CRASH CUSHION. L. N. Meinzer Meinco Mfg. Co., 1326 Silica Ave., Sacramento, Calif. 95815.

4,103,689. TISSUE PRESSURE PREFERENCE FOR CEREBROSPINAL FLUID SHUTING DEVICE. Stephen B. Leighton, 93 Jefferson Ave., Maplewood, N.J. 07040.

4,103,989. UNIT-POWER CONCENTRIC OPTICAL SYSTEMS. Seymour Rosin, 1246 Maury Rd., Orlando, Fla. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,120,600. CORNER BRACKET. Gordon H. Rees, 1650 Fillmore Ave., Buffalo, N.Y. 14211.

4,122,470. HINGED MULTIPLE EXPOSURE MAT ATTACHMENT FOR CAMERAS. Marvin E. Sackett, 5430-A Garfield Ave., Sacramento, Calif. 95841.

4,134,710. SIMULTANEOUS PLURAL DIRECTIONAL FLOW MOTOR. Dewit T. Atherton, 407 E St., Encinitas, Calif. 92024.

The following patents are offered by Philip C. Peterson. Inquiries should be directed to Peterson Boats, Inc., P.O. Box 7405, Chicago, Ill. 60680.

3,989,002. MOTOR POWERED WATER-CRAFT FOR RIDING IN STANDING POSITION.

D. 241,978. BOAT.

The General Electric Company is prepared to grant nonexclusive licenses under the following patents on reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to the General Electric Company, Component Products Group, 101 E. Carmel Drive, Suite 205, Carmel, Ind. 46032.

3,105,135. PENCIL SOLDERING IRON.

3,234,633. METHOD OF MAKING A SHEATHED ELECTRIC HEATING UNIT.

3,252,122. SHEATHED ELECTRIC HEATING UNIT.

4,093,846. MULTI-JET ELECTRODE BOILER.

Applications for license may be addressed to: General Electric Company, Re-entry and Environmental Systems Division, 3198 Chestnut St., Philadelphia, Pa. 19101.

4,092,263. METAL VAPOR GENERATOR.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Company, 1 River Road, Building #500, Room 218, Schenectady, N.Y. 12345.

4,054,469. DIRECTIONALLY SOLIDIFIED EUTECTIC GAMMA AND BETA NICKEL BASE SUPERALLOYS.

4,090,810. LIQUID-COOLED TURBINE BUCKET WITH ENHANCED HEAT TRANSFER PERFORMANCE.

Cleveland Technical Center, Inc., a wholly owned subsidiary of Penn-Central, offers for outright sale or for nonexclusive license on reasonable terms and conditions under the patents listed below. Inquiries should be addressed to Mr. James J. Lazroff, Manager, Cleveland Technical Center, Inc., 13600 Deise Ave., Cleveland, Ohio 44110.

3,259,145. VORTEX TUBE MANIFOLD ASSEMBLY.

3,269,191. ACCELERATION MEASUREMENT APPARATUS.

3,332,524. CAR RETARDER APPARATUS.

3,339,682. CAR RETARDER.

3,339,495. FLUID ACTUATED MOVING APPARATUS.

3,392,451. DYNAMIC RAILWAY TRACK INSPECTING APPARATUS.

3,432,210. BRAKING SYSTEM.

3,445,648. APPARATUS FOR CHECKING OPERATION OF POWER-PRODUCING COMPONENTS.

3,465,691. TIEDOWN SYSTEM.

3,466,543. ELECTRICAL METER SYSTEM EMPLOYING ELECTROLYTIC COULOMETERS AS MEASURING INSTRUMENTS.

3,490,292. ACCELERATION MEASUREMENT AND RECORDING DEVICE.

3,515,984. APPARATUS AND METHOD FOR MEASURING DISTANCE BETWEEN SPACED MAGNETIC MEMBERS.

3,635,310. APPARATUS AND METHOD FOR AUTOMATICALLY SERVICING JOURNAL BOXES OF RAILROAD CARS.

3,731,087. HOT BOX ALARM SYSTEM.

National Technical Information Service

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DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., S.W., Washington, D.C. 20324

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U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

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AF/JACP, 1900 Half St. SW., Washington, D.C. 20324

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Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
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Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 13, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-19-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-1-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-9-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-25-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	10-11-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-4-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-14-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-26-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-23-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-5-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-15-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-12-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-5-77

Expiration of patents: The patents within the range of numbers indicated below expire during January 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,015,103 to 3,019,439, inclusive
Plant Patents..... Numbers 2,117 to 2,129, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED FEBRUARY 6, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T979,001
INTERLAYER ENHANCEMENT OF INTERIMAGE EFFECTS

James L. Graham, 44 Briar Hill, Rochester, N.Y. 14626

Continuation of Ser. No. 502,573, Sep. 3, 1974, abandoned. This application Feb. 21, 1978, Ser. No. 879,574

Int. Cl.[2] G03C *3/00*

U.S. Cl. 96—74

No Drawing. 29 Pages Specification

The present invention is directed to a photographic element comprised of a support and, as coatings on the support, a layer comprised of a silver haloiodide emulsion sensitized to green light and a layer comprised of a silver haloiodide emulsion sensitized to red light. Interposed between these layers is a colloidal silver layer. The presence of the colloidal silver produces a favorable interimage effect, as compared to that achieved in its absence.

T979,002
OXYGEN CONCENTRATION DETECTOR

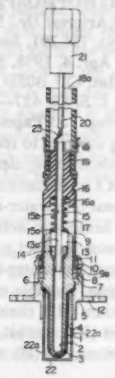
Yoshinori Akiyama, Kariya; Masami Ouki, Nagoya, and Masatosi Suzuki, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 14, 1978, Ser. No. 886,591

Int. Cl.[2] G01N *27/58*

U.S. Cl. 204—195 S

1 Sheets Drawing. 13 Pages Specification



An oxygen concentration detector of a waterproof construction comprises an oxygen ion conduction metal oxide (1) which produces an electromotive force in accordance with a difference between an oxygen concentration in gas component in a gas under test such as exhaust gas from an internal combustion engine of an automobile and an oxygen concentration in the atmosphere. The structure includes a coaxially arranged inner tube and an outer tube with the inner tube being housed in the outer tube with a water proof structure being interposed therebetween. The inner tube constitutes a lead wire to be electrically connected to that one of two electrodes for taking out the electromotive force which is created. The outer tube (18) serves to expose the inner electrode (2) to the atmosphere at a site such that water may not be splashed into the interior of the sensor.

T979,003
METHOD FOR PREPARING N-(CARBOXYETHYL-p-AMINOPHENOL

Norman C. Jamieson, St. Louis County, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Feb. 15, 1978, Ser. No. 877,914

Int. Cl.[2] C07C *51/00*

U.S. Cl. 562—452

No Drawing. 8 Pages Specification

N-(2-carboxyethyl)-p-aminophenol is prepared by reacting p-aminophenol with at least an approximately equimolar proportion of a lower alkyl acrylate in a solvent for the reactants to form an N-(2-carbalkoxyethyl)-p-aminophenol, separating the N-(2-carbalkoxyethyl)-p-aminophenol, hydrolyzing it to form N-(2-carboxyethyl)-p-aminophenol and isolating the N-(2-carboxyethyl)-p-aminophenol substantially free of impurities.

T979,004
N,N-BIS-(2-CARBOXYETHYL)-AMINOPHENOLS

Norman C. Jamieson, St. Louis County, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Feb. 15, 1978, Ser. No. 877,922

Int. Cl.[2] C07C *51/00*

U.S. Cl. 562—452

No Drawing. 7 Pages Specification

N,N-bis-(2-carbomethoxyethyl)-p-aminophenol is prepared by refluxing an aqueous solution of p-aminophenol and at least two molar proportions of acrylic acid to form N,N-bis-(2-carboxyethyl)-p-aminophenol, separating the N,N-bis-(2-carboxyethyl)-p-aminophenol and refluxing it with an excess of methanol in the presence of sulfuric acid to form N,N-bis-(2-carbomethoxyethyl)-p-aminophenol and isolating the N,N-bis-(2-carbomethoxyethyl)-p-aminophenol in relatively pure form.

T979,005
LIGHT EMITTING DIODES WITH BACK-SIDE EMISSION

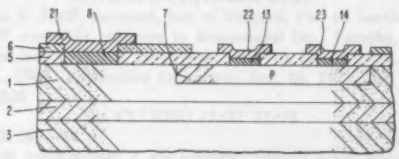
Harold D. Edmonds, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 476,812, Jun. 6, 1974, abandoned. This application Apr. 18, 1977, Ser. No. 788,179

Int. Cl.[2] H01L *33/00*

U.S. Cl. 357—17

5 Sheets Drawing. 22 Pages Specification



A back-side light-emitting diode comprised of an N-type free-standing monocrystalline planar substrate of a III-V ternary compound in which a P-type impurity is diffused into one of the planar surfaces, of the substrate, with the distance x in microns from the junction depth to the other planar surface conforming to the relationship $x = 0.5/\alpha$, where α is the absorption coefficient of said compound at a 7,000 Angstrom wavelength.

T979,006

TRAPEZOIDAL GATE FET DEVICE

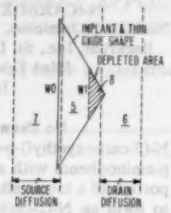
Gilbert Hadamard, deceased, late of Manasssas, Va., by Denise L. Hadamard, administratrix, Chemin de la Belloire, St. Jeannet, France

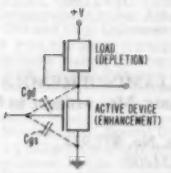
Continuation of Ser. No. 760,806, Jan. 19, 1977, abandoned. This application Jun. 28, 1978, Ser. No. 920,026

Int. Cl.[2] H01L *29/78*

U.S. Cl. 357—23

1 Sheets Drawing. 13 Pages Specification





A trapezoidal shaped FET gate structure is disclosed, having a small end juxtaposed with the drain of the device, to reduce the gate-to-drain capacitance and the Miller effect in an active device or to reduce the pinch-off voltage in an FET load device.

T979,007

ENERGY COST CALCULATOR

James E. Ogul, Frederick, and Roger L. Gamble, Gaithersburg, both of Md., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

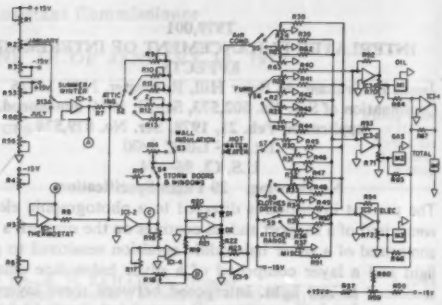
Filed Jun. 29, 1978, Ser. No. 920,413

Int. Cl.[2] G06F *7/38*

U.S. Cl. 364—900

2 Sheets Drawing. 12 Pages Specification

This invention relates to an electronic simulation device designed to simulate the energy system of a typical American household. This simulator is useful for informing building and heating contractors, architects, the financial community, homeowners, and concerned citizens of the impact of energy conservation measures available to them. The simulator has multiple controls for addressing information relating to space heating and cooling, hot water heating, appliances, lighting, climatic conditions, local costs of various sources of energy, amortization periods of capital equipment, and other variables as required. Digital meters on the panel of the device display



the cost, in both dollars and energy units, of operating the household being modeled with instantaneous changes occuring as conditions are varied by the user. This permits the operator of the simulator to experiment with various combinations of household energy sources and conservation measures and to observe a digital readout of estimated monthly energy expenditure.

T979,008

ASBESTOS TREATMENT WITH METAL ORTHOPHOSPHATES

Paul A. Pezzoli, 4910 Artcrest Dr., Midland, Mich. 48640

Continuation of Ser. No. 756,291, Jan. 3, 1977, abandoned. This application Apr. 4, 1978, Ser. No. 893,240

Int. Cl.[2] B05D *7/00*

U.S. Cl. 427—215

No Drawing. 33 Pages Specification

A method for treating asbestos to reduce its hemolytic activity is disclosed. The method comprises depositing on at least a portion of the asbestos a sufficient amount of a material consisting essentially of at least one water-insoluble metal orthophosphate to reduce the hemolytic activity of the asbestos. The resulting fibrous asbestos product consists essentially of asbestos fibers having at least one water-insoluble metal orthophosphate deposited thereon. Suitable metals include magnesium, calcium, barium, titanium (III), titanium (IV), chromium, manganese, iron (II), iron (III), cobalt, nickel, zirconium, silver, aluminum, zinc, cadmium, tin (II), tin (IV), and lead.

REISSUES

FEBRUARY 6, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,897

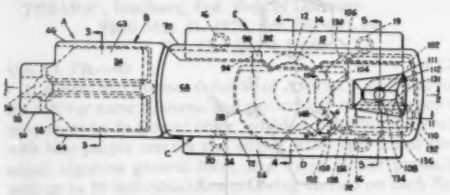
LATCHING DEVICE

Henry Heine, Vernon, and Irving Feinberg, Saddle Brook, both of N.J., assignors to Presto Lock Company, Division of Walter Kidde & Comany, Inc., Elmwood Park, N.J.

Original No. 3,908,416, dated Sep. 30, 1975, Ser. No. 405,119, Oct. 10, 1973. Application for reissue May 9, 1977, Ser. No. 794,792

Int. Cl.[2] E05B *65/52*

U.S. Cl. 70—71 **9 Claims**



16. A latching device cooperable with a hasp, the latching device comprising a frame having a projection integral therewith, the projection having an opening therethrough, a rotatable latch member, the latch member including a boss extending through said opening to provide a pivotal mounting for the latch member, the latch member being adapted to engage the hasp and draw the hasp toward the frame as the latch is rotated in one direction to a closed position wherein the latch member substantially overlies the frame and to release the hasp as the latch member is rotated in the opposite direction to an open position, wherein the latch member is substantially perpendicular to the frame, the latch member having a top wall and two spaced side walls, the projection having respective means cooperable with each of the side walls for limiting rotation of the latch member in said one direction to the closed position and in said opposite direction to the open position, and a leaf spring cooperable with means provided by the frame and with means provided by the latch member to bias the latch member against said projection, the leaf spring having an opening through which the boss extends.

Re. 29,898

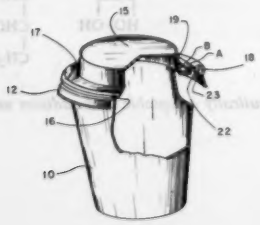
SELF-SEALING CONTAINER CLOSURE

Richard A. Wheeler, Houston, Tex., assignor to Ball Corporation, Muncie, Ind.

Original No. 3,952,910, dated Apr. 27, 1976, Ser. No. 610,354, Sep. 4, 1975. Application for reissue Jan. 24, 1977, Ser. No. 762,081

Int. Cl.[2] A47G *19/22*

U.S. Cl. 220—90.4 **18 Claims**



1. A self-sealing container closure comprising:

a central face having an aperture therethrough defined by overlapping edges,

a skirt extending from the periphery of the central face, said skirt having an integral engaging means formed on the inner face of the skirt for seating engagement with a rim portion of a container,

said means including an integral skirt member, said member having two adjacent sections, one section being disposed in one plane and the other section disposed in a second plane, said planes intersecting at an acute angle.

Re. 29,899

CHROME INSERT RING

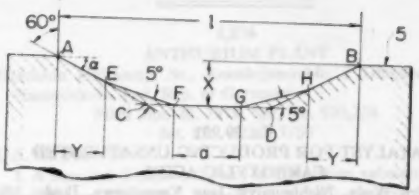
Isao Taniguchi, Yono, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Original No. 4,030,767, dated Jun. 21, 1977, Ser. No. 710,488, Aug. 2, 1976. Application for reissue Feb. 6, 1978, Ser. No. 875,661

Claims priority, application Japan, Aug. 2, 1975, 50-93697

Int. Cl.[2] F16J *15/00, 9/12*

U.S. Cl. 277—235 R **6 Claims**



1. A hard metal insert piston ring of the type having a groove in the periphery thereof, said groove being filled with said hard metal, the cross section of said groove having a flat bottom wall and two flat side walls extending angularly from the surface of said piston ring towards said flat bottom surface and towards one another, the improvement characterized by; said cross section of said groove having additional flat side walls between said first mentioned side walls and said flat bottom surface, all said walls and said bottom surface meeting at angles greater [that] *than* the angle between imaginary extensions of said first side walls and said flat bottom surface.

Re. 29,900

PICK-TYPE MINING BIT WITH SUPPORT BLOCK HAVING ROTATABLE SEAT

Thomas B. Kniff, deceased, late of Bedford, Pa., by Servia B. Kniff, executrix, assignor to Kennametal Inc., Latrobe, Pa.

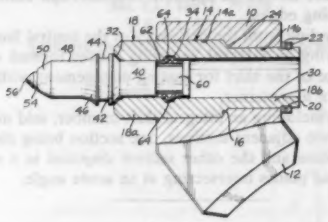
Original No. 3,499,685, dated Mar. 10, 1970, Ser. No. 751,094, Aug., 1968. Application for reissue Jun. 16, 1977, Ser. No. 807,026

Int. Cl.[2] E21C *13/02, 35/18*

U.S. Cl. 299—86 **17 Claims**

19. In combination: a non-rotatable support block having a bore; a sleeve of hard wear resistant material rotatably mounted in said bore; and a pick type bit having a shank rotatably receivable in one end of said sleeve; first means retaining said sleeve in said bore while permitting rotation of the sleeve in the bore; and second means detachably retaining said shank in said sleeve while permitting rotation of the shank in the sleeve so that rotation can occur both with and without rotation of said sleeve; said bore having a larger end part nearest the bit and a smaller end part remote from the bit; and a shoulder formed on the block at the juncture of said

parts of said bore; said sleeve having a larger end part nearest the bit and a smaller end part remote from the bit and a shoulder facing away from said one end of said sleeve formed at the juncture of the respective end parts of the sleeve; said sleeve rotatably fitting the larger and smaller end parts respectively of said bore;



said bit having a cylindrical shank at one end and tapering in at the other end to a point and said shoulders on said sleeve and said support block interengaging one another for sustaining axial thrusts imposed on said sleeve by said bit during working operations.

Re. 29,901

CATALYST FOR PRODUCING UNSATURATED CARBOXYLIC ACIDS

Masahiro Wada, Nishinomiya; Isao Yanagisawa, Ikeda; Michikazu Ninomiya, Kobe, and Takashi Ohara, Nishinomiya, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Original No. 3,886,092, dated May 27, 1975, Ser. No. 396,474, Sep. 12, 1973. Division of Ser. No. 190,661, Oct. 19, 1971, Pat. No. 3,833,649. Application for reissue Oct. 18, 1977, Ser. No. 843,351

Claims priority, application Japan, Oct. 23, 1970, 45-92759

The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.

Int. Cl.² B01J *27/20, 29/16*

U.S. Cl. 252—443 **8 Claims**

1. A catalyst adapted for the production of unsaturated carboxylic acids through the vapor phase oxidation of unsaturated aldehydes comprising a catalytic oxide supported on an inert carrier, said catalytic oxide consisting essentially of the recited metal elements in the atomic ratio Mo:V:Cu:Cr:W of 12:2–14:1–6:0–4:0–12 with the proviso that Cr + W is not O, said inert carrier having a surface area not greater than 2 m^2/g and a porosity of 30 to 65%, at least 90% of the pores having a pore diameter in the range of 50 to 1,500 microns.

2. The catalyst of claim 1 wherein said inert carrier is selected from α-alumina, silicon carbide, pumice, silica, zirconia, titanium oxide and mixtures thereof.

Re. 29,902

6-ARYLOXY-2-OXO-1-AZA-4-OXO (OR THIA)-SPIRO[4,5]DECANES AS CNS STIMULANTS

Roland Y. Mauvernay, Riom; Norbert Busch, La Tourette; Jacques Moleyre, Menetrol; Jacques Simond, Chamalieres, and André Monteil, Gerzat, all of France, assignors to Centre Europeen de Recherches Mauvernay, Riom, France

Original No. 4,000,292, dated Dec. 28, 1976, Ser. No. 616,357, Sep. 24, 1975. Application for reissue Oct. 17, 1977, Ser. No. 843,086

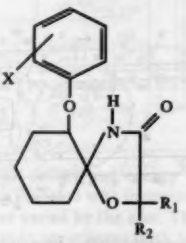
Claims priority, application France, Sep. 27, 1974, 74 32777; Aug. 4, 1975, 75 24296

Int. Cl.² A61K *31/42; C07D 263/52*

U.S. Cl. 424—272 **7 Claims**

1. A compound of the formula:

(I)



in which R_1 and R_2 respresent each, independently from one another, a member selected from the group consisting of hydrogen, a lower alkyl or phenyl; X is hydrogen, a halogen atom or a lower alkyl.

7. A method for stimulating the central nervous system which comprises administering to the patient an effective amount of a compound as described in claim 1.

Re. 29,903

ANTIBACTERIAL ANTIBIOTICS AM31α, AM31β AND AM31γ

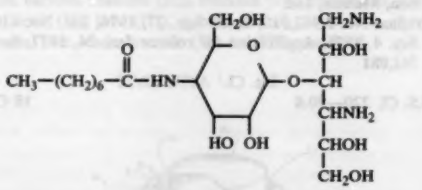
Jane P. Kirby, New City, and Donald B. Borders, Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Original No. 3,987,029, dated Oct. 19, 1976, Ser. No. 559,998, Mar. 19, 1975. Continuation-in-part of Ser. No. 436,008, Jan. 23, 1974, abandoned. Application for reissue Feb. 22, 1977, Ser. No. 770,481

Int. Cl.² C07H *15/12, 15/04*

U.S. Cl. 536—17 **2 Claims**

16. A compound selected from the group consisting of the antibiotic free base of the formula:



and the pharmaceutically acceptable acid-addition salts thereof.

PLANT PATENTS

GRANTED FEBRUARY 6, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,373
AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA", Isselburg, Fed. Rep. of Germany

Filed May 31, 1978, Ser. No. 911,296
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African Violet known by the cultivar name Alabama and particularly characterized as to uniqueness by its flower color, which is predominantly white, with blue-purple centers and edges; wavy and frilled flower edges; vigorous growth habit, and by its flower production, with up to 10 individual flowers being carried on each flower stem.

4,374
AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA", Isselburg, Fed. Rep. of Germany

Filed May 31, 1978, Ser. No. 911,297
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African Violet plant characterized by the combined characteristics of dark green leaves and strong upright peduncles each of which carries 10–12 individual flowers; generally red-purple flower color, with a tendency toward lighter streaking in the petals extending generally radially in the petal from the center of the flower, with the flowers being non-dropping and comprised of three relatively larger petals and two relatively smaller petals which together form a generally symmetrical flower appearance, and by its prolific flowering characteristic which provides a full and tight bouquet above the foliage.

4,375
ANTHURIUM PLANT

Hermann Holtkamp, Sr., Kueningsmuehle, 2 Dingden, 4236 Hamminkeln, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 920,225
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct cultivar of anthurium substantially as described and illustrated, known by the cultivar name Senior II and characterized by the combined features of fiery red, generally heart-shaped spathe having a wavy surface and a slight indentation along an edge thereof; straight and wiry petioles which position the spathe slightly above the leaves; medium to dark green leaves; early blooming habit; slightly spreading growth habit, and by the ability to be asexually reproduced only by tissue culture.

4,376
ANTHURIUM PLANT

Hermann Holtkamp, Sr., Kueningsmuehle, 2 Dingden, 4236 Hamminkeln, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 920,226
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct cultivary of anthurium, substantially as described and illustrated, known by the cultivar name Senior I and particularly characterized by the combined features of fast and compact growth habit; orange-red, generally heart shaped spathe having a grooved or ridged surface and a slight indentation along one side thereof; early blooming habit, straight and strong petioles, light to medium green leaves which provide an attractive contrast with the orange-red spathe and white-yellow spadix; propagation by side shoots or tissue culture, and by its suitability for pot production.

PLANT PATENTS

GRANTED FEBRUARY 6, 1979

4,128

ARTIFICIUM PLANT

Herman Hoffmann, Sr., Koenigswinter, 3 Ringelen, 4134 Himmelstein, Fed. Rep. of Germany

Filed Jan. 28, 1978, Ser. No. 873,232

Int. Cl.² A01H 1/00

U.S. Cl. PP.—58 1 Claim

A new and distinct cultivar of Artificium plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

4,129

ARTIFICIUM PLANT

Herman Hoffmann, Sr., Koenigswinter, 3 Ringelen, 4134 Himmelstein, Fed. Rep. of Germany

Filed Jan. 28, 1978, Ser. No. 873,236

Int. Cl.² A01H 1/00

U.S. Cl. PP.—58 1 Claim

A new and distinct cultivar of Artificium plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

4,130

AFRICAN VIOLET PLANT

Friedrich Hellmund, Isenburg, Fed. Rep. of Germany, assignor to Gesellschaft für die Erhaltung genossenschaft "OP TIMARA", Isenburg, Fed. Rep. of Germany

Filed May 31, 1978, Ser. No. 911,206

Int. Cl.² A01H 1/00

U.S. Cl. PP.—61 1 Claim

A new and distinct cultivar of African Violet known by the cultivar name Alabama Joy particularly characterized in its vegetative by its flower color, which is predominantly white, with blue-purple centers and edges; wavy and frilled flower edges; vigorous growth habit; and by its flower production, with up to 10 individual flowers being carried on each flower stem.

4,131

AFRICAN VIOLET PLANT

Friedrich Hellmund, Isenburg, Fed. Rep. of Germany, assignor to Gesellschaft für die Erhaltung genossenschaft "OP TIMARA", Isenburg, Fed. Rep. of Germany

Filed May 31, 1978, Ser. No. 911,209

Int. Cl.² A01H 1/00

U.S. Cl. PP.—59 1 Claim

A new and distinct cultivar of African Violet plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

4,132

ROSE PLANT

Ko. Zwijnenburg, Boskoop, Netherlands

Filed Jan. 29, 1976, Ser. No. 653,502

Int. Cl.² A01H 1/00

U.S. Cl. PP.—58 1 Claim

A new and distinct variety of rose plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

4,133

ROSE PLANT

Ko. Zwijnenburg, Boskoop, Netherlands

Filed Jan. 29, 1976, Ser. No. 653,503

Int. Cl.² A01H 1/00

U.S. Cl. PP.—58 1 Claim

A new and distinct variety of rose plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

4,134

ROSE PLANT

Ko. Zwijnenburg, Boskoop, Netherlands

Filed Jan. 29, 1976, Ser. No. 653,504

Int. Cl.² A01H 1/00

U.S. Cl. PP.—58 1 Claim

A new and distinct variety of rose plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

4,135

ROSE PLANT

Ko. Zwijnenburg, Boskoop, Netherlands

Filed Jan. 29, 1976, Ser. No. 653,505

Int. Cl.² A01H 1/00

U.S. Cl. PP.—58 1 Claim

A new and distinct variety of rose plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

4,136

ROSE PLANT

Ko. Zwijnenburg, Boskoop, Netherlands

Filed Jan. 29, 1976, Ser. No. 653,506

Int. Cl.² A01H 1/00

U.S. Cl. PP.—58 1 Claim

A new and distinct variety of rose plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

4,137

ROSE PLANT

Ko. Zwijnenburg, Boskoop, Netherlands

Filed Jan. 29, 1976, Ser. No. 653,507

Int. Cl.² A01H 1/00

U.S. Cl. PP.—58 1 Claim

A new and distinct variety of rose plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

4,138

ROSE PLANT

Ko. Zwijnenburg, Boskoop, Netherlands

Filed Jan. 29, 1976, Ser. No. 653,508

Int. Cl.² A01H 1/00

U.S. Cl. PP.—58 1 Claim

A new and distinct variety of rose plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

4,139

ROSE PLANT

Ko. Zwijnenburg, Boskoop, Netherlands

Filed Jan. 29, 1976, Ser. No. 653,509

Int. Cl.² A01H 1/00

U.S. Cl. PP.—58 1 Claim

A new and distinct variety of rose plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

4,140

ROSE PLANT

Ko. Zwijnenburg, Boskoop, Netherlands

Filed Jan. 29, 1976, Ser. No. 653,510

Int. Cl.² A01H 1/00

U.S. Cl. PP.—58 1 Claim

A new and distinct variety of rose plant substantially as herein shown and described, characterized by its vigorous growth habit, and by its ability to be normally reproduced only by tissue culture.

PATENTS

GRANTED FEB. 6, 1979

ERRATA

For CLASS	See PATENT NO.
126–271	4,137,612
051–392	4,137,670
405–202	4,137,722
152–330 RF	4,137,894
277–080	4,138,049
422–058	4,138,215
422–056	4,138,216
422–151	4,138,217
422–120	4,138,218
422–144	4,138,219
422–173	4,138,220
074–079	4,138,247
106–084	4,138,261
195–001.5	4,138,287
195–001.8	4,138,288
195–030	4,138,289
195–031 F	4,138,290
195–047	4,138,291
195–059	4,138,289
202–180	4,138,293
204–055 R	4,138,294
204–098	4,138,295
204–128	4,138,296
204–157.1 R	4,138,297
204–159.12	4,138,298
204–159.16	4,138,299
204–159.22	4,138,300
195–127	4,138,333
528–045	4,138,372
521–038	4,138,373
528–208	4,138,392
526–287	4,138,393
546–089	4,138,401
546–275	4,138,402
568–881	4,138,588
362–375	4,138,716

PATENTS

GRANTED FEB. 6, 1979

ERRATA

PATENTS

GRANTED FEBRUARY 6, 1979

GENERAL AND MECHANICAL

4,137,572

PROTECTIVE GLOVE, ESPECIALLY INTENDED FOR ICE HOCKEY PLAYERS

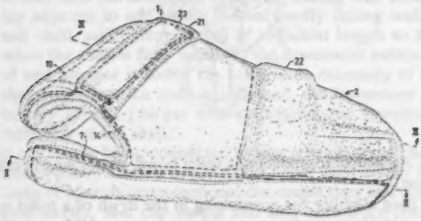
Janne K. G. Jansson, and Leif H. Skottheim, both of Malung, Sweden, assignors to Jofa AB, Malung, Sweden

Filed Dec. 20, 1977, Ser. No. 862,512

Claims priority, application Sweden, Dec. 20, 1976, 7614303

Int. Cl.[2] A41D *13/10*

U.S. Cl. 2—16 **8 Claims**



1. A protective glove, especially for ice hockey players, said glove including an outer portion enclosing the fingers, an intermediate portion enclosing the hand, a cuff portion enclosing the wrist and lower part of the forearm and a stall portion enclosing the thumb, each of said portions comprising an inner layer and an outer layer, covering the inside and outside, respectively, of said fingers, hand, wrist with lower forearm portion and thumb, respectively, said inner and outer layers consisting of a thin pliable material, and each of said outer layers over substantially the whole area thereof having padding which is connected to adjacent padding over an elongated flexible joint, the padding of the thumb stall portion extending into and substantially all over the cuff portion along the adjacent side edge of the cuff portion padding and enclosing a protective strip which is of stiff material and which is of such a length as to reach all the way through the thumb stall padding in bridging relation to the thumb root.

4,137,573

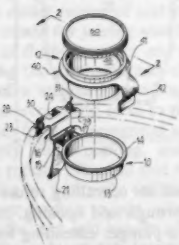
URINE SPECIMEN COLLECTOR

Daniel E. Kroeger, 2029 167th Ave., San Leandro, Calif. 94578

Continuation of Ser. No. 663,023, Mar. 2, 1976, abandoned. This application Nov. 30, 1977, Ser. No. 856,153

Int. Cl.[2] E03D *13/00;* **A61B** *10/00*

U.S. Cl. 4—144.1 **13 Claims**



9. A fixture adapted to be removably secured to a water closet for use with a removable liner for collecting a urine specimen, said fixture comprising:

a bracket member having an inverted generally U-shaped clamp portion adapted to embrace the rim of said water closet, a downwardly extending leg portion adapted to contact the inner surface of said water closet and a laterally extending spacer portion interconnecting said clamp portion and said leg portion;

an annular receptacle;

means for securing said receptacle to said bracket member, said securing means including a generally U-shaped member attached to and extending laterally of said receptacle; and

means for providing supplemental stability for said fixture comprising an abutment element extending upwardly from the upper surface of said clamp portion a sufficient distance to provide abutting engagement with the seat portion of said water closet;

said leg portion of said bracket member extending below said receptacle to provide support therefor when placed in contact with said inner surface of said water closet;

said spacer portion extending from said clamp portion to said leg portion in the direction of said receptacle;

said bracket member and said receptacle being fabricated from a sterilizable material.

4,137,574

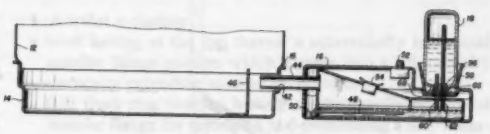
PORTABLE STEAM BATH

Jack Collins, R.R. #1 Box 288, Mt. Juliet, Tenn. 37122

Filed Aug. 9, 1977, Ser. No. 822,991

Int. Cl.[2] A61H *33/06*

U.S. Cl. 4—160 **5 Claims**



1. A portable, completely self contained, steam bath unit comprising two mating, rigid and generally oval dish shaped portions adapted to be clamped together and carried by a handle; one of said portions having a bracket for supporting it in inverted position from a support spaced well above the floor; said inverted portion having a heat lamp mounted therein to delay the condensing of generated steam; the other of said portions being positioned on the floor in an upright position directly below said inverted portion; a curtain depending from said inverted portion and terminating within said upright portion; a steam generator detachably connected with said upright portion; and a water reservoir detachably connected to said generator; said curtain, generator and reservoir all being contained within said rigid portions when clamped together in carrying position.

4,137,575

SWIMMING POOL TARPAULIN

Friedemann Klaffke, Gorxheimertal, and Klaus Heckel, Weinheim, Bergstr., both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Bergstr., Fed. Rep. of Germany

Filed Jun. 24, 1977, Ser. No. 809,885

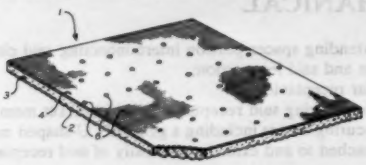
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 7621892[U]

Int. Cl.[2] E04H *3/19*

U.S. Cl. 4—172.12 **2 Claims**

1. A laminated tarpaulin with thermal insulation for a swimming pool, comprising a closed-cellularly foamed, elastic plastic inner layer with flotation features, a top layer of porous material and a bottom layer of an impenetrable, flexible material; and wherein the top layer is woven of a polyolefin, the inner layer is foamed polyethylene with a thickness of about 3

to 15 mm and the bottom layer is a polyolefin with a thickness of about 30 to 100 microns, the bottom layer and the bottom of



the inner layer having a waffle-like embossment; said tarpaulin in combination with a swimming pool for covering the water therein.

4,137,576

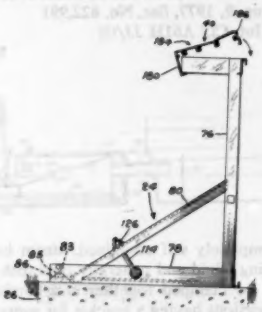
SWIMMING POOL

Samuel Greene, 18 Underwood Dr., West Orange, N.J. 07052

Filed Jan. 31, 1977, Ser. No. 764,192

Int. Cl.[2] E04H *3/18*

U.S. Cl. 4—172.19 **20 Claims**



1. A swimming pool retaining wall comprising:

(a) a plurality of spaced wall posts mounted on concrete footings;

(b) a pair of interconnected frame members supported on the footing connected to and supporting the wall post on the external face thereof;

(c) a deck support extending in superposition to the frame members connected at the top of the wall post;

(d) horizontal braces notch connected between adjacent wall posts;

(e) a pair of reversible "Z" bars connected on the top and bottom of the internal face of the wall posts;

(f) each of the "Z" bars having a flange on one side and a groove on the other side each extending in the opposite direction;

(g) the wall post having horizontal slots into which the flange of each of the "Z" bars is inserted to position the grooves on the top and bottom facing each other;

(h) fastening means affixing the "Z" bars to the wall posts;

(i) wall sections slid between and held by the grooves of the "Z" bars;

(j) a walk deck non-fastenerly connected to the deck support by one edge fixedly engaging the underside of the deck support and the other edge yieldably engaged at the groove of the top "Z" bar; and

(k) a plastic pool liner affixed to the yieldable edge of the walk deck.

4,137,577

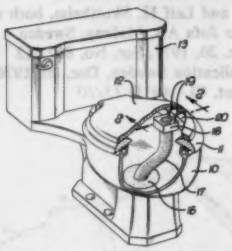
TOILET BOWL CLEANING DEVICE

Don A. Maxfield, 8123 Magnolia Ave., Riverside, Calif. 92502

Filed Jan. 10, 1978, Ser. No. 868,395

Int. Cl.[2] E03D *9/02*

U.S. Cl. 4—231 **9 Claims**



6. An article for cleaning a toilet bowl, comprising in combination:

a plug member for positioning in the drain of a toilet bowl, said plug member comprising a water soluble material;

a flexible tube with one end of said tube carried in said plug member providing a flow path through said plug member; and

means for mounting the other end of said tube on the toilet bowl at a position above the normal water level in the bowl.

4,137,578

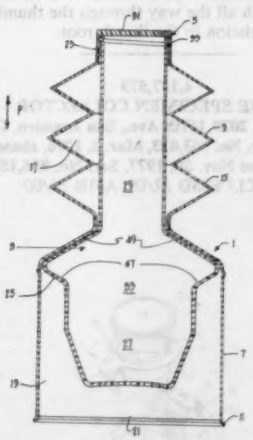
KITCHEN SCOOP AND PLUNGER

John D. Felici, 260 Geo. Waterman Rd., Apt. 302, Johnston, R.I. 20919

Filed Oct. 8, 1976, Ser. No. 730,766

Int. Cl.[2] A47J *43/28*; A47L *17/00*; B25F *1/00*

U.S. Cl. 4—255 **6 Claims**



1. A kitchen utensil for corralling refuse over a drain opening and forcing it through said opening, comprising a unitary outer hollow shell, a plunger extending longitudinally within said outer hollow shell and cap means for retaining the plunger in the shell, said shell including a lower hollow walled cavity of relatively large cross-sectional dimension and having a lowermost extremity for guiding refuse to said drain, the inner dimension of said shell at its lowermost extremity being larger than said drain opening thereby to define a refuse cavity, said shell further including an upper hollow walled cavity having

an uppermost portion upon which said cap resides, said upper walled cavity being of smaller cross-sectional dimension than said lower cavity and having located in its walls means for collapsing and retracting said shell thereby to extend and retract said plunger, the upper and lower cavity being joined by an outwardly flaring wall,

said plunger comprising a lowermost extremity compatible with, but of smaller dimension than said drain opening, an upper neck portion extending through and beyond said upper hollow walled cavity of said shell and being of lesser cross-sectional dimension than said upper cavity, and a lower bulb portion residing in said lower cavity of said shell and being of larger cross-sectional dimension than said upper cavity, said bulb portion being connected to said neck portion by an outwardly flaring wall extending adjacent to and below the outwardly flaring wall of said shell, said plunger being of sufficient length so that when the shell is fully retracted the lowermost extremity of said plunger is above the lowermost extremity of the shell and when the shell is collapsed, the lowermost extremity of said plunger extends beyond the lowermost extremity of the shell,

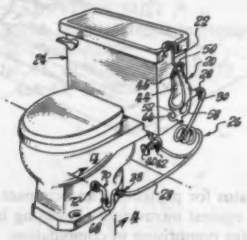
said cap means being connected to that portion of said neck means which extends beyond said upper shell cavity and being of a larger cross-sectional dimension than said upper shell cavity, said cap means and said outwardly flaring walls co-operating to retain the plunger in the shell.

4,137,579

URINE DRAIN

Peter S. Soler, P.O. Box 87, Covina, Calif. 91723

Filed Dec. 20, 1977, Ser. No. 862,346
Int. Cl.[2] E03D *13/00*; A61F *5/44*
U.S. Cl. 4—311 5 Claims



1. A urine drain system comprised of a receptacle member; a flexible, extendable tubular drain line; a flexible, extendable tubular flushing water supply line; valve means for controlling the flow of the flushing water; fluid tight coupling means for joining said drain line and said flushing water supply line to said receptacle member; removable filter means situated in said flushing water supply line; a second removable filter means situated in the drain outlet region of said receptacle member; fluid tight coupling means for joining said flushing water supply line to a source of flushing water, and a P-trap and insert assembly for coupling the discharge end of said drain line to the sewage outlet of a standard plumbing installation; said combination being interconnectd so as to provide for the passage of flushing water from a pressurized source through said flushing water supply line, coupling, and removable filter means, into a handle rigidly affixed to said receptacle member, said handle containing an internally enclosed tubular passage for said flushing water leading to said valve means, also situated within said handle, and said handle additionally containing a second internally enclosed, tubular passage for said flushing water leading from said valve means to an annular water passage contained within a lip formed about a generally ovoid opening in said receptacle member, providing for the entry of urine from the user's person, said annular passage containing a plurality of holes distributed about the periphery of said lip such that the flushing water, when released by said valve means, is directed downward along the internal surface of said receptacle member, carrying urine downward toward an outlet region formed into said receptacle member, through said second filter means removably situated therein, and into said drain line, whereupon the liquid is transferred by gravity out of said discharge end of said drain line; said receptacle member being further configured so as to comfortably fit in close proximity to a standing user of either sex while being held in one hand; and said valve means being positioned on said handle such that on finger of the holding hand may operate the flushing system.

4,137,580

TOILET

Robert C. Iwans, Farmington, and Richard C. Lamb, Plantsville, both of Conn., assignors to Koehler-Dayton, Inc., New Britain, Conn.

Filed Jul. 18, 1977, Ser. No. 816,584
Int. Cl.[2] E03D *11/02*
U.S. Cl. 4—420 5 Claims

1. A toilet including

a bowl having at the top thereof a substantially horizontal annular flange portion which merges into a substantially vertically extending annular lip portion,

a first flush ring portion having a substantially horizontal annular flange for resting on and establishing a non-watertight seal with said bowl flange portion,

a second flush ring portion having a substantially horizontal annular flange for resting on and establishing a non-watertight seal with said first flush ring portion flange,

said first and second flush ring portions defining a flush ring having an annular opening, and

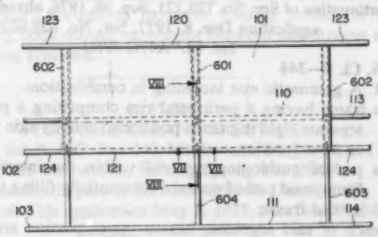
means for maintaining said first and second flush ring portions on said toilet bowl flange.

4,137,581

ROLLOVER STRETCHER

Betty M. Daly, Box 108 115 Lake Dr., Broadway, N.C. 27505

Filed Jun. 20, 1977, Ser. No. 807,792
Int. Cl.[2] A61G *1/00, 7/06*
U.S. Cl. 5—82 R 2 Claims



1. In a stretcher for handling patients, said stretcher having a supporting panel mounted on a main frame, said main frame having a first set of cross-members,

an auxiliary frame, formed of two spaced longitudinal members joined by a second set of cross-members,

with each of the first set of cross-members slidably joined to an individual cross-member of the second set of cross-members, so that the auxiliary frame may be slid sideways in relation to the main frame,

with the said main frame and the said auxiliary frame each shaped so as to freely rest in the open assembly position on surfaces of a substantially common horizontal plane, such that in a closed assembly position, the main frame extends directly over the auxiliary frame, while in an open assembly position, the main frame extends alongside of the auxiliary frame and such that in the open assembly position the main frame can be freely rested directly upon a first bed while the auxiliary frame is freely rested directly upon a second bed, of the general height of the first bed, with the device in the closed assembly position serving as a hand-held stretcher, in which

the main frame is formed of a pair of spaced longitudinal members mounted to the panel with each said longitudinal member extending beyond each opposed end of the panel to form a handle, with

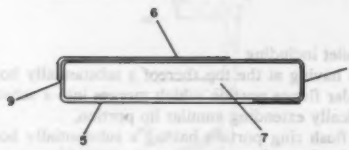
the longitudinal members of the auxiliary frame spaced so as to each align adjacent a longitudinal member of the main frame in the closed assembly position.

4,137,582

BED CLOTHING

Walter D. Korp, 4 A Magnolia Cir., Dade City, Fla. 33525

Filed Oct. 11, 1977, Ser. No. 841,048
Int. Cl.[2] A47C *23/00*; A47G *9/00*
U.S. Cl. 5—334 C **1 Claim**



1. In combination, a bed sheet, mattress cover construction comprising a bottom mattress cover sheet and a top mattress cover and bottom bed sheet, said sheets being joined along the bottom end and sides thereof to provide an open ended pocket adapted to receive a mattress, a top bed sheet joined along its bottom end to the bottom ends of said first mentioned sheets, said top sheet being substantially wider than the first mentioned sheets to provide top sheet edge material adapted to extend downwardly across the sides of the mattress.

4,137,583

GYMNASTIC MAT

Beecher B. Baldwin, Los Angeles, and Harold Higgins, San Diego, both of Calif., assignors to Baldwin/Green Inc., El Cajon, Calif.

Continuation of Ser. No. 728,221, Sep. 30, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,652
Int. Cl.[2] A47G *9/00*
U.S. Cl. 5—344 **4 Claims**

1. A gymnastic mat including in combination:

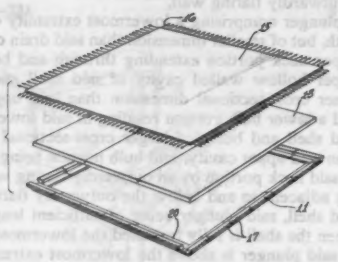
a frame having a peripheral rim comprising a plurality of separate rigid segments positioned side-by-side to provide an open interior;

a pad of cushioning material within the interior of said frame, said pad of material substantially filling the interior of said frame;

each of said segments has an upper portion and a lower portion, with said lower portion extending under said pad into said interior of said frame beyond said upper portion;

a cover of flexible material and having a top surface; and

a plurality of resilient connectors fixed to said cover along the edges thereof and below said top surface, with said connectors and frame segments having interengaging means attaching said cover to said frame with said resilient connectors stretched and maintaining said cover in tension with a smooth top surface, said cover and connectors imparting an inward acting force on said frame, said inward acting force serving to compress said pad of cushioning material, said pad of cushioning material imparting an equal and opposite outward acting force on said frame and cover.



4,137,584

INSECT AND REPTILE BARRIER FOR OUTDOORSMEN

Norman G. Sharber, 515 W. Vavasupi Rd., P.O. Box 1059, Flagstaff, Ariz. 86002

Filed Oct. 3, 1977, Ser. No. 838,494
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—344 **6 Claims**

1. Apparatus for protecting an occupant within a predetermined area against intrusion by crawling insects and reptiles, said apparatus comprising in combination:

a. a ground cloth for supporting the occupant, said ground cloth having a perimeter defining the predetermined area;

b. an inflatable smooth surfaced barrier of vinyl plastic secured to said ground cloth in proximity to the perimeter of said ground cloth for establishing an encircling enclosure about the occupant;

c. said barrier including a smoothly curved outer lateral wall having a smooth surface devoid of surface discontinuities for preventing crawling insects and reptiles from obtaining sufficient traction to traverse said barrier;

whereby, said smooth surface outer lateral wall, in combination with the vertical height presented by said outer lateral wall, inhibits passage of crawling insects and reptiles within the predetermined area.

4,137,585

BUOYANCY COMPENSATOR AND INFLATION SYSTEM

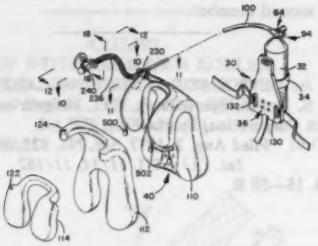
William M. Wright, III, Mission Viejo, Calif., assignor to U.S. Divers Co., Santa Ana, Calif.

Filed Jun. 10, 1977, Ser. No. 805,417
Int. Cl.[2] B63C *9/24*
U.S. Cl. 9—314 **11 Claims**

1. A unit for filling a buoyancy compensator comprising:

means adapted for connection to a second stage breathing gas regulator of the type used by an underwater diver;

a conduit connected to said connection means for conducting the flow of exhaust gas from said second stage regulator;



valving means interposed in the flow of exhaust gas for diverting the exhaust gas from said second stage regulator for flow into said conduit; and,

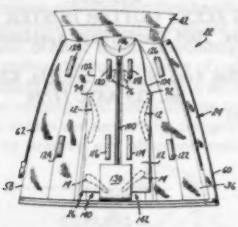
means for connecting said conduit to a buoyancy compensator for inflation purposes.

4,137,586

SURVIVAL SUIT

Karla R. Evert, St. Cloud, Minn., assignor to Stearns Manufacturing Company, St. Cloud, Minn.

Filed Jul. 11, 1977, Ser. No. 814,719
Int. Cl.[2] B63C *9/08*
U.S. Cl. 9—341 **8 Claims**



1. A survival suit comprising:

(a) a survival jacket, said survival jacket comprising:

(i) an outer flotation jacket having flotation material therein;

(ii) an inner jacket of substantially water impervious material having thermal insulation characteristics and elastic properties, said inner jacket sized to fit snugly and conform to the torso of the wearer to provide thermal protection for major areas of heat loss from the torso yet allow for torso movement thereby also providing a comfortable fit;

(iii) means for securing said inner jacket within said outer jacket; and

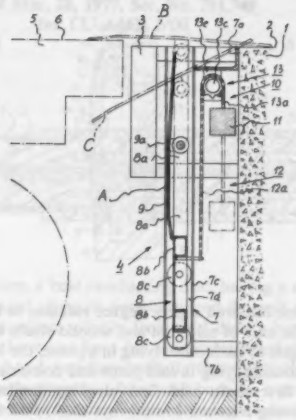
(b) means including a crotch flap connected to said survival jacket for preventing said jacket from riding upward on the body when immersed, said crotch flap sized to substantially cover and thermally insulate the crotch and groin region of the torso.

4,137,587

DOCKBOARD APPARATUS

Knut T. L. Rosengren, Box 115, 243 00 Hoor, Sweden

Continuation of Ser. No. 733,295, Oct. 18, 1976, abandoned. This application Jan. 27, 1978, Ser. No. 872,877
Claims priority, application Sweden, Oct. 17, 1975, 7511653
Int. Cl.[2] E61D *1/00*
U.S. Cl. 14—71.3 **4 Claims**



1. A dockboard apparatus for a loading dock having a horizontal loading surface and a vertical front wall, the apparatus comprising:

(a) a support;

(b) a vertically movable chassis on said support;

(c) a ramp pivotally supported by said chassis for movement between a substantially vertical storing position and a substantially horizontal working position;

(d) a counterbalancing means coupled with said chassis for facilitating manual movement thereof, the counterbalancing means including a counterweight;

(e) first and second linkage means each connecting said counterweight to said chassis;

(f) first and second hubs, said first hub being operatively coupled with said first linkage means and said second hub being operatively coupled with said second linkage means;

(g) said support including an upper support member which has an upper rear part disposed substantially at the same level as the loading surface of the loading dock, said upper support member also having an upper front part disposed substantially below the level of said upper rear part, said first and second hubs being mounted in spaced relationship on said upper front part;

(h) whereby said ramp may assume a pronounced forward, downward inclination from the loading surface of the loading dock during movement between said storing and working positions.

4,137,588

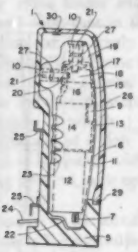
PORTABLE CLEANING DEVICE

Clayton C. Sandt, P.O. Box 243, Mt. Pocono, Pa. 18344, and Ira L. Kulp, 205 Elwyn Ave., Sinking Spring, Pa. 19608

Continuation-in-part of Ser. No. 620,166, Oct. 6, 1975, abandoned. This application May 2, 1977, Ser. No. 792,548
Int. Cl.[2] A46B *13/02*
U.S. Cl. 15—22 R **6 Claims**

1. A portable cleaning device comprising a waterproof housing with openings providing access to enclosed first electrical engaging terminals, on-off operating switch, first cleaning implement receiving tongue and second cleaning implement receiving tongue, the opening nearest said terminals comprises

a slot in said housing, said first electrical engaging terminals connected to rechargeable batteries contained within said waterproof housing, said rechargeable batteries providing electrical energy to an electric motor contained within said housing when said operating switch is closed, an output of said electric motor adapted to rotatably attach to a gear train contained within said housing, said gear train rotatably connected to cam means providing alternating reciprocating motion limited to one hundred eighty degree rotation to first and second shafts, the axes of said first and second shafts being located at right angles to each other lying in a plane, the longitudinal axis of said housing lying in said plane and coincident with the axis of said first shaft, said first cleaning implement receiving tongue being fastened to said first shaft, said second cleaning implement receiving tongue being fastened to said second shaft.

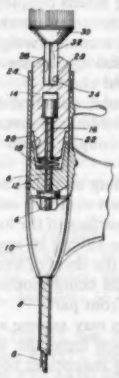


4,137,589

SCOURING DEVICE

Sukhnandan Sukhraj, 48-50 38 St., Long Island City, N.Y. 11101

Filed Sep. 21, 1977, Ser. No. 835,423
Int. Cl.[2] A46B *13/02*
U.S. Cl. 15—28 **6 Claims**



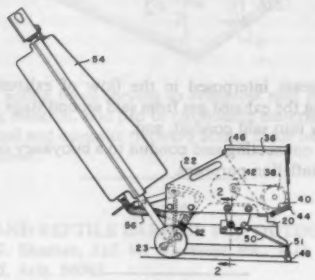
1. A scouring device comprising a stationary housing having a motor therein, an electrical connection means extending from said motor for connection to a power source, a flexible drive shaft extending from said housing and at a first end of said shaft connected to said motor, a mobile housing, said mobile housing having a first member mounted therein and fixed to said shaft and adapted to rotate therewith and a second member axially spaced from said first member and in alignment with said first member, said second member being axially slidable in said housing and having means for receiving and retaining a scrubber means at a free end thereof, said shaft having an extension extending into said second member and having means thereon for retaining said second member in said housing, said shaft being rotatable relative to said second member, spring means biasing said second member to a position axially spaced from said first member, and complementary connection means on said first and second members adapted to interconnect with each other, whereby to transmit rotation of said flexible shaft to said second member.

4,137,590

DEVICE FOR SCRUBBING CARPET

Robert S. Brown, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 2, 1977, Ser. No. 821,188
Int. Cl.[2] A47L *11/34, 11/162*
U.S. Cl. 15—50 R **5 Claims**



3. A device for scrubbing carpets, using powdered cleaning composition, comprising:

a frame;

scrubbing means rotatably mounted on said frame for agitating powdered cleaning composition in the pile of said carpet; and

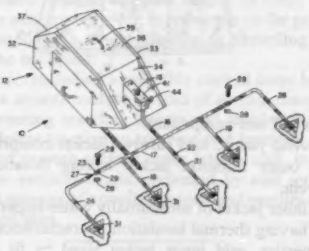
means mounted on said frame for pressing powdered cleaning composition into the pile of said carpet prior to action thereupon by said scrubbing means.

4,137,591

BOWLING ALLEY GUTTER DUSTER APPARATUS

David E. Baker, 1004 Gardenway, Apartment A, Manhattan, Kans. 66502

Filed Aug. 29, 1977, Ser. No. 828,454
Int. Cl.[2] A47L *11/24*
U.S. Cl. 15—98 **10 Claims**



1. A bowling alley gutter duster apparatus which is operable to move up and down the ball return chute disposed between adjacent alleys wherein the chute has a generally horizontal top disposed between generally vertical side walls, the apparatus comprising:

housing means;

guidance means affixed to said housing means and operable to engage the top and sides of the chute and to support the housing on the chute;

propulsion means affixed to said housing means and operable

in combination with said guidance means to propel said housing means along the chute; and

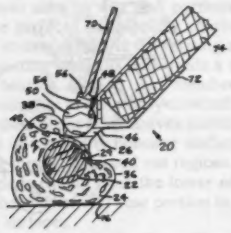
dusting means affixed to said housing means and coactable with at least one of the bowling alley gutters.

4,137,592

MOP WITH A WRINGER ROLLER

Arthur K. Brown, Jr., 1640 N. Kenmore, South Bend, Ind. 46628

Filed Dec. 27, 1977, Ser. No. 864,373
Int. Cl.[2] A47L *13/144*
U.S. Cl. 15—119 A **10 Claims**



1. A mop comprising:

a cylindrical core means;

a resilient absorbent material attached to and covering the greater portion of said cylindrical core means;

a first handle attached to said cylindrical core means and extending substantially perpendicular thereto in the plane thereof;

first pin means connected to said cylindrical core means;

bracket means pivotally connected to said cylindrical core means through said first pin means;

second pin means rotatably carried by and located on said bracket means a fixed distance from said first pin means and substantially parallel thereto; and

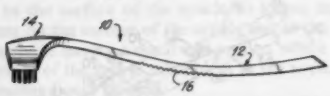
roller means secured to said second pin means and extending substantially parallel to the core means, said absorbent material forming first and second resilient edges for holding said roller means adjacent said first handle on opposite sides thereof between a respective resilient edge and the first handle, said bracket means responding to an input force by overcoming the holding force of one of said first and second resilient edges and moving in an arc about said first pin means causing said roller means to rotate with said second pin means and uniformly compress said absorbent material to remove any absorbed material located therein.

4,137,593

TOOTHBRUSH AND METHOD OF MAKING THE SAME

Robert P. Porper, 301 E. 87th St., New York, N.Y. 10028

Filed Jun. 13, 1977, Ser. No. 806,329
Int. Cl.[2] A46B *9/04*
U.S. Cl. 15—167 A **9 Claims**



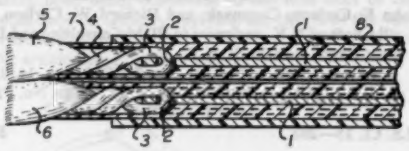
1. A toothbrush comprising an elongate handle portion and a head portion at one end of said handle portion, said head portion having two generally planar surfaces defining therebetween a first predetermined angle less than 180° to form a generally V-shaped space; and two bristle supporting pads each fixedly mounted on one of said surfaces to direct the bristles on said pads inwardly into said V-shaped space and towards each other at a second predetermined angle therebetween.

4,137,594

ROTARY CLEANING BRUSHES

Claude Arnal, and François Fidry, both of 6 Rue Pelleport, Paris 75020, France

Filed Mar. 28, 1977, Ser. No. 781,749
Int. Cl.[2] A46B *1/00*
U.S. Cl. 15—198 **5 Claims**



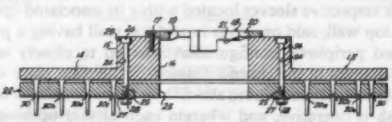
1. In combination, a heat conducting disc, having a number of openings arranged along its periphery, and through each of said openings extending radially from said disc, a bundle of wires forming at least one knot for a predetermined distance extending beyond said periphery radially therefrom, the wire bundles having ends extending from said knot for a predetermined distance thereby opening up and forming a substantially cylindrical surface serving as a rotary brushing surface, a first layer of elastomer attached to said disc and extending to cover all the knots formed along its periphery as well as all wire ends extending from said knots in an expanding fashion; and a second layer of elastomer of substantially less diameter than said first layer, attached to said first layer at least on one side thereof, and extending radially over at least said section of the heat conducting disc, from which the wires extend, and further extending leaving exposed to the air a peripheral portion of the first layer and a portion of the adjoining knots; the remainder of the knots being left substantially uncovered by said second layer thereby forming a flexible base for the movement of said knots during the brushing operation as well as permitting heat conduction to the air through said peripheral portion of said first layer.

4,137,595

ROTARY TOOL FOR STRIPPING ADHESIVE CARPETING FROM FLOORING

George L. Stewart, 600 NW. 195th Ter., and Robert L. Howell, 17131 NW. 9th Pl., both of Miami, Fla. 33169

Filed Nov. 4, 1977, Ser. No. 848,507
Int. Cl.[2] A47L *11/00*
U.S. Cl. 15—200 **8 Claims**



1. A rotary tool for stripping adhesive carpeting from flooring, comprising, in combination, a circular base support member adapted to be drivingly coupled to a rotary drive floor machine, a circular clamp plate, a plurality of axially-extending through openings in said clamp plate, a plurality of flat sided, tapered, hardened, headed nails received through said clamping plate openings with their points extending outwardly of the bottom of said clamp plate, said openings being tapered and of such shape as to conform with the peripheral shape of the shanks of said headed nails received therein, so as to prevent the passage therethrough of the heads of said nails, and means for clamping the top of said clamp plate in coaxial relation with

respect to the underside of said circular base support member and against the heads of said headed nails for securing them in place in their clamp plate openings.

4,137,596

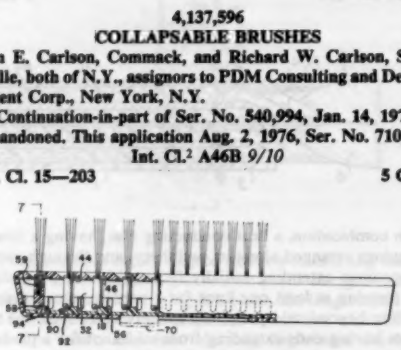
COLLAPSABLE BRUSHES

John E. Carlson, Commack, and Richard W. Carlson, Stormville, both of N.Y., assignors to PDM Consulting and Development Corp., New York, N.Y.

Continuation-in-part of Ser. No. 540,994, Jan. 14, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,708

Int. Cl.² A46B *9/10*

U.S. Cl. 15—203 **5 Claims**



1. A brush construction comprising a hollow casing defining an internal cavity and having a top wall along one side of said cavity; said top wall having a predetermined array of openings formed therein; a slide plate slidably mounted in said cavity below and spaced from said top wall for sliding movement between first and second positions; a plurality of brush elements in said cavity respectively associated with said openings; each of said brush elements including a brush portion having a free tip end and an opposed mounting end and a mounting sleeve secured to the mounting end of the brush portion and pivotally mounted on said slide plate; each of said brush elements having a central axis and being located on said plate in the first position thereof, with the portion of their respective mounting sleeves connected to the slide plate offset from their associated openings, with the central axis thereof at an acute angle to the general plane of said top wall, and with said free tip ends thereof located within their associated openings; and in the second position of the slide plate with the portion of their respective mounting sleeves connected to the slide plate located substantially directly below their associated openings, with the central axis of the brush elements extending generally perpendicularly to the slide plate whereby the brush portions thereof extend through said openings and with a portion of their respective sleeves located within its associated opening in the top wall; said openings in said top wall having a predetermined peripheral configuration selected to closely surround said sleeves in the second position of the slide plate whereby the sleeves are supported about their entire periphery when the brush is operative, and wherein each of said openings being inclined in said top wall along an acute angle with respect to the plane of the top wall in generally the same direction as the angle of the central axis of the brush elements to the plane of the top wall in the first position of said side plate, and wherein said top wall has upper and lower surfaces and said openings define peripheral edges about the openings in said surfaces, the peripheral edges of the respective openings in said surfaces being partly superimposed to define a through passage in said top wall extending generally perpendicularly to the top wall and dimensioned to receive the portion of the mounting sleeve adjacent the mounting end of its associated brush portion whereby said sleeve is peripherally supported against movement in the second position of said slide plate.

4,137,597

ROLL CLEANING DEVICE

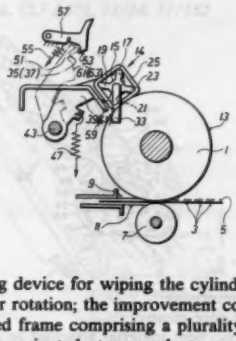
Karlheinz Achenbach, and Dieter Brückel, both of Kaufbeuren, Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Nov. 23, 1977, Ser. No. 854,221

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653519

Int. Cl.² G03G *21/00*

U.S. Cl. 15—256.51 **9 Claims**



1. In a cleaning device for wiping the cylindrical face of a roll supported for rotation; the improvement comprising:

(a) an elongated frame comprising a plurality of elongated support webs oriented at an angle to one another in a star-like configuration; each support web having a free longitudinal edge;

(b) a cleaning felt secured about said frame and supported by the free longitudinal edges of the support webs; said cleaning felt being divided into a plurality of cleaning felt portions by any two neighboring free longitudinal edges;

(c) pressing levers movably supported adjacent said roll and being displaceable into a working position and a withdrawn position; said pressing levers including frame supporting means for rotatably holding and positioning said frame at opposite ends thereof, parallel to the axis of said roll in said working position of said pressing levers; and

(d) spring means connected to said pressing levers for urging said pressing levers towards said roll for pressing said frame, held in said frame supporting means, against said roll into an operating position; in said operating position one of said cleaning felt portions being urged into a shape-conforming engagement with said cylindrical face of said roll along the length thereof.

4,137,598

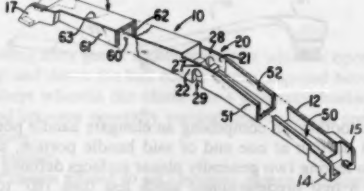
WINDSHIELD WIPER BLADE HOLDER HAVING ARTICULATED MOLDED YOKES

Bernard C. Sharp, White Plains, N.Y., assignor to Parker-Hannifin Corporation, Shelton, Conn.

Filed Jul. 18, 1977, Ser. No. 816,261

Int. Cl.² B60S *1/40*

U.S. Cl. 15—250.42 **7 Claims**



7. In a windshield wiper blade holder comprising a primary pressure distributing yoke having a central portion adapted to

be coupled with a wiper arm and claw yokes articulated to the ends of the primary yoke, each claw yoke being a molded plastic body comprising inner and outer arms formed with claws on their ends for holding and distributing pressure to a wiper blade unit and having between said arms a coupling and bearing structure engaged pivotably onto mating structure on an end of the primary yoke, the improvement wherein said coupling and bearing structure of each claw yoke comprises spaced side walls extending upwardly at opposite sides of said body and a base portion presenting an upwardly concave bearing surface between said side walls, said side walls lying laterally outward of said bearing surface and being formed with transverse openings therein, said openings being bordered at their respective upper sides by side wall portions presenting downwardly concave surfaces substantially coaxial with said bearing surface, said mating structure comprising a transverse bearing member presenting along its under side a convex surface seated on said bearing surface, said member extending laterally into and terminating in oppositely directed pivot posts which present along their upper sides convex surfaces seated in said openings on said downwardly concave surfaces,

said openings being formed by cored out regions of said side walls, which regions extend from the lower edges of said side walls over the ends of said base portion to said downwardly concave surfaces,

said side wall portions being elastically resilient, said pivot posts having tapered lower end surfaces which, upon being engaged with and pressed downward relative to said wall portions, will spring the latter apart and thus snap said bearing member into engagement with said concave surfaces,

the inner arm of said body being formed by inward extensions of said base and said side walls which constitute an upwardly open channel extending from said coupling and bearing structure to the claws on the inner arm end, said primary yoke having therealong a substantially T-shaped cross-section the head portion of which overlies said extensions of said side walls and and the leg portion of which is a substantially rigid beam structure that is fitted into said channel and becomes nested into it progressively farther, thus increasing its lateral stability, as said inner arm is pivoted farther toward said primary yoke,

the outer arm of said body being formed by outward extensions of said side walls with a top wall joining them to constitute a downwardly open channel extending to the claws on the outer arm end, whereby the claw yoke is given required rigidity by molded wall sections of relatively little thickness and weight.

4,137,599

SUCTION SYSTEM FOR CLEANING CARPET AND THE LIKE

Chester G. Steyer, 8224 Greenock Dr., Bon Air, Va. 23235

Filed Jun. 3, 1976, Ser. No. 692,280

Int. Cl.[2] A47L *7/00*

U.S. Cl. 15—300 A **5 Claims**

1. Apparatus for removing sediment from an article to be cleaned, comprising:

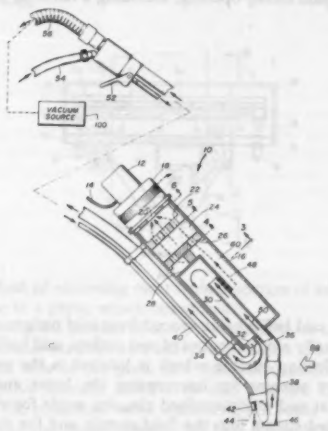
liquid applying nozzles on a manifold connected to a delivery hose from a supply source for applying a cleaning liquid to the surface of the article to loosen embedded sediment on the surface of the article and in the article;

a cleaning head having a distal end portion which contacts the surface of the article subsequent to the application of the cleaning liquid thereto;

a first vacuum source known in the art disposed in a relatively remote and relatively stationary location from and relative to the remaining portions of the apparatus for creating a vacuum over the area of contact between the distal end portion of the cleaning head and the surface of the article;

vacuum lines disposed between said first vacuum source and the cleaning head for connecting said first vacuum source and the cleaning head, said vacuum lines consisting of a liquid return hose connected to a wand tube, said wand tube connected to a cylinder, said cylinder having a tube inlet at the lower end, said liquid return hose being connected to said vacuum source and said tube inlet being connected to said cleaning head;

a second vacuum source mounted on said cylinder in surmounting relation to the cleaning head for creating a vacuum additional to that provided by the first vacuum source, thereby producing in cummulative fashion a relatively greater vacuum level over the area of contact between the cleaning head and the surface of the article than would be created by the first vacuum source alone, the cleaning head being connected to the tube inlet of the vacuum lines for directly applying the effects of the vacuum created by the first and second sources to the surfaces of the article being cleaned; and



deflecting means within said cylinder to deflect and change direction of sediment-laden liquid and the comingled air entering the cleaning head, the sediment-laden liquid being channeled into at least a portion of said vacuum lines with some comingled air, a major portion of said comingled air moving toward second vacuum source after the deflection and change of direction and being vented from the second vacuum source to ambient, said deflecting means consisting of an extension connected to said tube inlet, said extension projecting partly into and spaced from a deflector cup, said deflector cup being located within said cylinder at the lower end thereof, the lower end of said deflector cup partly surrounding and communicating with connection of said wand tube with said cylinder.

4,137,600

CLEANING APPARATUS

Hartmut Albishausen, Auf den 30 Morgen, 6382 Friedrichsdorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 723,195, Sep. 14, 1976, Pat. No. 4,073,030. This application Dec. 19, 1977, Ser. No. 861,637

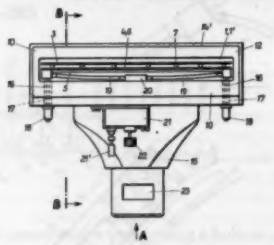
Claims priority, application Austria, Sep. 15, 1975, 7052/75; Belgium, Sep. 15, 1976, 846242; Brazil, Sep. 10, 1976, 7605980; Canada, Sep. 14, 1976, 261184; Denmark, Sep. 14, 1976, 4144/76; Fed. Rep. of Germany, Sep. 10, 1976, 2640697; France, Sep. 14, 1976, 76 27545; Ireland, Sep. 14, 1976, 2048/76; Italy, Sep. 14, 1976, 69234 A/76; Luxembourg, Sep. 14, 1976, 75791; 75791; Netherlands, Sep. 15, 1976, 76-10269; Sweden, Sep. 14, 1976, 7610156; Switzerland, Sep. 9, 1976, 11474/76; United Kingdom, Sep. 8, 1976, 37246/76

Int. Cl.[2] A47L *7/00*

U.S. Cl. 15—322 **15 Claims**

1. In a cleaning arrangement of the type having a suction

source and a cleaning fluid source, a combination comprising a movable cleaning head including a suction attachment connected to the suction source, an elongated intake opening lying in a plane and juxtaposed with contaminated portions of a surface to be cleaned during normal use, and a suction channel extending intermediate said suction attachment and said intake opening and operative for conveying flowable media from the contaminated surface portions being cleaned to the suction source; means for injecting streams of cleaning fluid in respective paths into said suction channel, including a plurality of fluid discharge outlets in said suction channel, said outlets communicating with the cleaning fluid source and being spaced along a row which extends generally along the elongation of said intake opening; means for directing the respective streams in the form of a fluid curtain towards said intake opening at a predetermined acute cleaning angle relative to the plane of said intake opening, including a baffle in said suction



channel, said baffle being spaced from said outlets and extending generally along the row of said outlets, said baffle having a fluid-deflecting surface which is located in the paths of the respective streams for intercepting the latter and which is inclined at said predetermined cleaning angle for merging the intercepted stream into the fluid curtain and for directing the latter towards said intake opening during normal use to thereby subdivide said suction channel into a dry-cleaning zone in which substantially only loose contaminants are removed from the contaminated surface portions being cleaned, and a wet-cleaning zone in which contaminants released from the contaminated surface portions by the cleaning fluid are removed together with the latter; and means for adjusting the size of said dry-cleaning zone relative to said wet-cleaning zone, including adjusting members operatively connected to said baffle and mounting the same on said cleaning head for adjustable arresting in any of a plurality of positions relative to said suction channel.

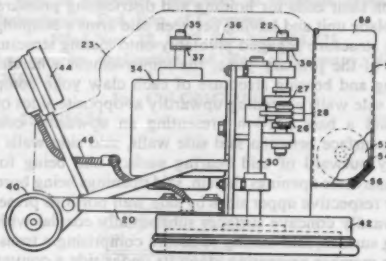
4,137,601

DEVICE FOR SCRUBBING SURFACES

Paul W. Eschenbach, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 2, 1977, Ser. No. 821,164
Int. Cl.[2] A47L *9/04*
U.S. Cl. 15—380 **5 Claims**

1. A device for scrubbing surfaces, comprising:
a frame;
a scrubber means adapted to angularly oscillate in the tangent plane of said surface;
means for mounting said scrubber on said frame and angularly oscillating said scrubber means including,
a crankshaft, mounted on said frame, adapted for rotation about its longitudinal axis and having a driving portion which is offset from the longitudinal axis of said crankshaft;
a coupling link, one end of which is pivotably attached to the driving portion of said crankshaft;
a rocking link, one end of which is pivotably attached to the other end of said coupling link; and
a drive shaft substantially parallel to said crankshaft, adapted for angular oscillation about its longitudinal axis, one end of which is rigidly attached to the other



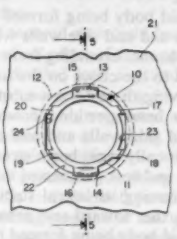
end of said rocking link, the other end of which is attached to said scrubber means; and
means for guiding the device.

4,137,602

MULTIPURPOSE BUSHING AND APERTURE LOCKING SYSTEM

Ferdinand Klumpp, Jr., Mountainside, N.J., assignor to Heyman Manufacturing Company, Kenilworth, N.J.

Filed Nov. 11, 1977, Ser. No. 850,548
Int. Cl.[2] B65D *55/00*
U.S. Cl. 16—2 **5 Claims**



1. A multipurpose snap bushing including an outer flange, said outer flange of greater diameter than an aperture into which said bushing is insertable, said outer flange having no openings in its continuity, a collar extending from said outer flange, said collar of lesser diameter than said aperture, said collar having no openings in its continuity, snap means, said snap means adapted to engage the wall of said aperture and hold said bushing engaging said wall between said outer flange and said snap means, said snap means extending outwardly from the periphery of said collar, said snap means positioned to engage opposite sections of said aperture wall, and four spacers, said spacers extending from said collar a radius distance of said aperture, said spacers co-actable in pairs, the distance between two points on two edges of each of said pairs of said spacers defining a line approximately equal to the chord defined by the normally flattened sides of round apertures flattened to receive non-rotatable bushings.

4,137,603

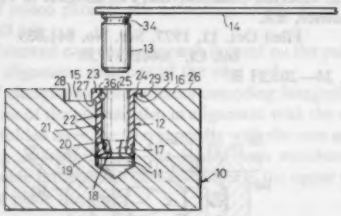
PIVOT ASSEMBLIES OF SWING WINDOWS

Harald Kvasnes, Vegsund, Norway, assignor to Kva-Spil Ltd., Spjelkavik, Norway

Filed Dec. 1, 1977, Ser. No. 856,512
Claims priority, application Norway, Dec. 7, 1976, 764163
Int. Cl.[2] E05D *5/12, 15/28*
U.S. Cl. 16—169 **11 Claims**

1. In a swing window comprising a pivotable window sash bounded by a stationary window frame, a pivot assembly

which comprises a pivot bearing in the form of a socket adapted for pushing axially into and locating permanently within a bore defined by said sash, a pivot pin connected to said frame and for reception in said bearing, said pivot pin being formed with a stop designed to be lockingly engaged by a locking device when said pin is received in said bearing



whereby only a pivoting motion of said pin relative to said bearing is permitted and the improvement consisting in said locking device being supportable in said pivot bearing in a plane within both an adjacent end face of said bearing and an adjacent side face of said sash and being directly actuable into and out of said locking engagement by axial displacement thereof via an adjacent opening in said side face of said sash.

4,137,604

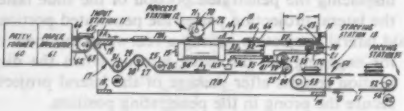
PROCESSOR-STACKER FOR PAPERED FOOD PATTIES AND LIKE LAYERED OBJECTS

Glenn A. Sandberg, Lockport, and George N. Howe, New Lenox, both of Ill., assignors to Formax, Inc., Mokena, Ill.

Filed Nov. 2, 1977, Ser. No. 847,703

Int. Cl.² A22C *7/00*; B65G *57/00*

U.S. Cl. 17—32 **11 Claims**



1. A stacker-processor for papered food patties or like layered objects comprising:

an endless belt conveyor including a generally horizontal conveyor run for transporting layered objects from an input station to a discharge-stacking station;

process means, located at a process station intermediate the input station and the discharge-stacking station, for processing the upper layer of each object traversing the process station on the conveyor;

a shuttle at the discharge-stacking station;

shuttle drive means for shifting the shuttle along a horizontal path between an extended position and a retracted position;

a nose sprocket mounted on the upper outer end of the shuttle;

an idler sprocket mounted on the lower inner end of the shuttle, both sprockets engaging the conveyor belt;

shuttle control means, responsive to arrival of an object on the conveyor at a discharge position adjacent the extended position of the nose sprocket, for actuating the shuttle drive means to shift the shuttle rapidly to its retracted position, abruptly shortening the discharge end of the conveyor and discharging the object to fall freely onto a stack accumulator below the shuttle with no appreciable change in orientation;

the shuttle control means further actuating the shuttle drive means to shift the shuttle back to its extended position in time to preclude premature discharge of the next object on the conveyor;

counter means, pre-settable to any desired stack count within a given range, for counting movements of the shuttle to its retracted position;

and stack accumulator control means for actuating the stack accumulator to remove a stack of objects from the discharge-stacking station each time the preset count is recorded in the counter means.

4,137,605

SEPARATION OF MEAT FROM BONES

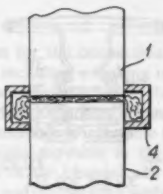
Johannes D. van Rij, Zevenaar, and Johannes W. Smits, Oss, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 14, 1977, Ser. No. 815,775

Claims priority, application United Kingdom, Jul. 14, 1976, 29341/76

Int. Cl.² A22C *17/00*

U.S. Cl. 17—46 **6 Claims**



4. A method of removing meat from a portion of meat containing bone in a press, which comprises:

(a) subjecting the portion of meat containing bone to such a compression between two movable plungers along a longitudinal axis of the press that substantial pieces of the meat move laterally relative to said axis and the bone within the portion of meat containing the bone;

(b) gripping the bone between the two movable plungers within the press;

(c) severing the bone-free, structurally intact meat, which has moved laterally, from the remaining, compressed bone-and-meat mass; and

(d) subsequently removing the compressed mass from the press.

4,137,606

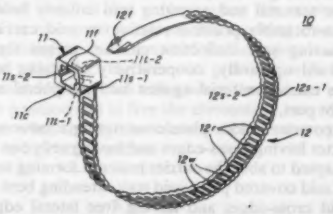
WEBBED HARNESSING DEVICE

William E. Wood, Hudson, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed May 27, 1977, Ser. No. 801,448

Int. Cl.² B65D *63/00*

U.S. Cl. 24—16 PB **8 Claims**



1. A harnessing device comprising a head having an elongated guide channel extending therethrough,

a pair of deflectable locking tangs within said head,

and a strap formed by a ladder structure with rungs which are sequentially engaged by the locking tang when the strap is inserted into the channel,

said ladder structure having a webbed portion substantially constant thickness extending from each rung to reduce the

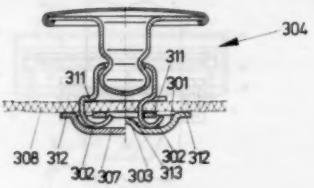
force for insertion of said strap into said channel and to limit the effect of reverse thrust applied to said strap in causing reverse rotation of said locking tang.

4,137,607

BUTTON, PARTICULARLY FOR CLOTHING PIECES

Friedhelm Kramer, Ennepetal-Milspe; Günter Wolfertz, Wuppertal-Barmen; Harald Klaus, Wuppertal-Elberfeld; Raimund Stanik, Wuppertal-Beyenburg, and Walter Ramspott, Wuppertal-Cronenberg, all of Fed. Rep. of Germany, assignors to Schaeffer-Homberg GmbH, Wuppertal, Fed. Rep. of Germany

Division of Ser. No. 626,987, Oct. 29, 1975, Pat. No. 4,033,012.
This application Mar. 14, 1977, Ser. No. 777,097
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1975, 2503798; Feb. 7, 1975, 2505139; Jul. 16, 1975, 2531728
Int. Cl.[2] A44B *1/42*
U.S. Cl. 24—95 **19 Claims**



15. A button, particularly for clothing pieces including a carrier material in fastened condition, comprising

a foot part having a wall formed in the shape of a vertically oriented open ended hollow member defining a hollow cavity therein, said foot part having a lower peripheral edge defining a lower opening communicating with said cavity and abutting an upper side of the carrier material and clamping claws integrally extending from said wall and non-rotatably clamping said peripheral edge and the carrier material and piercing through the latter,

a button plate operatively freely selectively tiltably seated on said foot part,

a tilting pin secured to said button plate, said tilting pin having a bulge-shaped lower end,

said foot part having an upper head end, the latter being formed with an insert opening communicating with said hollow cavity and freely tiltably mountably receiving said bulge-shaped lower end of said tilting pin therein,

a counter holder plate abutting an underside of the carrier material, and having curved deflection channel means for turning said clamping claws around pointing upwardly in said counter holder plate in a direction toward said hollow cavity,

said securing claws passing downwardly through said carrier material and engaging said counter holder plate in non-rotatable position relative to said carrier material, entering said deflection channel means thereby being turned upwardly, cooperatively clamping and pressing the carrier material against said peripheral edge of said foot part,

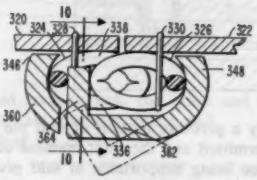
said counter holder plate constituting a covered plate, the latter having cross-edges and having only one central stay adapted to abut the carrier material forming an inner layer of said covered plate, said stay extending bent from one of said cross-edges and having free lateral edges on both sides of said stay defining penetration openings adjacent said lateral edges on both sides of said stay, said covered plate having a cap-shaped outer layer spaced opposite from said inner layer having therewith a U-shape cross-section, said outer layer defining said curved deflection channel means aligned with said penetration openings, said stay being formed with one opening therein and having a free end bent from said inner layer, said free end constitutes a support leg means for supporting said stay, said support leg means having a free edge abutting an inner surface of said outer layer, said inner surface facing said stay.

4,137,608

SLIDE FASTENER WITH ADJUSTABLE STOP

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Filed Oct. 11, 1977, Ser. No. 841,039
Int. Cl.[2] A44B *19/36*
U.S. Cl. 24—205.11 R **10 Claims**



1. A slide fastener with an adjustable stop comprising

a pair of planarly disposed carrier tapes,

a pair of coupling means secured to respective inner longitudinal edges of the pair of tapes,

a slider slidably mounted on the pair of coupling means for opening and closing the slide fastener,

a slider stop member having a flexible portion and a channel for receiving at least one of the pair of coupling means,

said stop member having a prong extending inward for penetrating into a portion of the slide fastener when the flexible portion is forced inward,

a lateral projection on the end of the prong for resiliently displacing the penetrated portion of the slide fastener as the lateral projection passes the penetrated portion, and

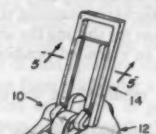
said lateral projection having a rearward abutment surface for engaging the displaced portion when the displaced portion returns after passage of the lateral projection to secure the prong in the penetrating position.

4,137,609

LOCKING SLIDER FOR A SLIDE FASTENER

Stanley G. Kedzierski, Saegertown, Pa., assignor to Textron Inc., Providence, R.I.

Filed May 8, 1978, Ser. No. 903,457
Int. Cl.[2] A44B *19/30*
U.S. Cl. 24—205.14 A **3 Claims**



1. A slider for a slide fastener comprising

a slider body including spaced upper and lower parallel wings joined by a head piece,

a raised attachment boss formed on the upper wing of the slider body and having attachment recesses formed in both of its lateral side surfaces, the upper wing having cam apertures formed through it on each lateral side of the attachment boss and a respective channel extending along the surface of the upper wing from each cam aperture to the rear of the slider body;

an elongated pull tab having an attachment opening formed in it and opening onto its front end;

a pair of attachment tabs on the pull tab extending from opposite sides of the attachment opening, the attachment tabs being received in the attachment recesses to pivotally secure the pull tab to the slider body with the attachment boss being received in the attachment opening;

a pair of raised parallel ribs extending longitudinally along the pull tab;

a pair of curved cam supports each formed on the pull tab in linear alignment with one of the ribs; and

a pair of elongated cam members extending integrally from the front of the pull tab also in alignment with the ribs and being folded over the cam supports with the cam supports serving as folding dies, the folded cam members being receivable through the cam apertures in the upper wing to lock in place the slider.

4,137,610

INDUSTRIAL TWO-MEMBER RELEASABLE LOCKING FASTENER

Cuyler Hoen, Rennesselaer, N.Y., assignor to Simmons Fastener Corporation, Albany, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,187
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—221 K **9 Claims**

1. A fastener comprising a turn member adapted to be fastened to a first panel, a securing means on one side of said first panel for positioning said turn member relative to said first panel, a flat spring resilient means for resiliently separating said turn member and said first panel on the opposite side of said first panel; said turn member comprising as a unitary stamped sheet metal single thickness member a head portion and a shank portion, said shank portion having a securing means seat, a restricted middle portion in the form of two oppositely disposed indentations, and a nose portion;

said fastener further comprising a receptacle member adapted to be fastened to a second panel, said receptacle having a base, said base having an elongated opening, an indentation transverse to said opening and extending on opposite sides of said opening away from said opening, and a projecting stop;

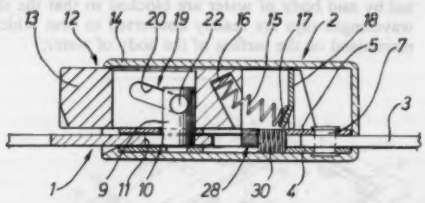
wherein upon alignment of said nose with said opening and upon insertion of said turn member into said base member, said restricted shank portion will cooperate with said opening whereupon angular rotation of said turn member relative to said receptacle member will locate and seat said turn member in said indentation upon removal of said turn member insertion force.

4,137,611

LATCH MECHANISM FOR SAFETY BELTS

Stig M. Lindblad, 20 rue Saint-Pierre, CH-1701 Fribourg, Switzerland

Filed Nov. 22, 1977, Ser. No. 853,887
Claims priority, application Sweden, Nov. 22, 1976, 7613014
Int. Cl.[2] A44B *11/25*
U.S. Cl. 24—230 AL **4 Claims**



1. Latch mechanism for the connection of two parts of a safety belt means and including a locking member attached to one part and a latch member attached to the other part of said means, said latch member comprising a frame having a channel in which the locking member is insertable to connect the two members, locking means movable in the frame between a releasing position out of the channel and a locking position located in the channel and cooperating with rest surfaces of the locking member when the locking means is inserted in the channel and locking the same, maneuvering means movable in the frame between a first and a second position and biased to move towards the second position, said maneuvering means being in driving connection with the locking means for actuating the same to be in its releasing position when the maneuvering means is in its first position and to be in the locking position when the maneuvering means is in its second position, a rejector element movable between an outer position in which it is biased to reject the locking member out of the channel when the same is released by the locking means and an inner position to which the rejector element is forced by the locking member when it is in its inserted position in the channel, and a catching mechanism arranged to be in an actuating position holding the maneuvering means in its first position when the rejector element is in its outer position or adjacent to its outer position and to free the maneuvering means to move to its second position when the rejector element is in or is adjacent to its inner position, said catching mechanism comprising at least one element connected to the frame and provided with a first rest surface and at least one element connected to the maneuvering means and provided with a second rest surface which is provided to be positioned behind the first rest surface when the catching mechanism is in its actuating position, whereby the rest surfaces are positioned so that the second rest surface is at a small distance behind the first rest surface when the maneuvering means is in its innermost position, the catching mechanism further comprising means connected to the rejector element and provided to obstruct the elements provided with the rest surfaces to be in front of each other when the rejector element is in its inner position and to free the elements to move in front of each other when the rejector element is in its outer position or adjacent to its outer position.

4,137,612

BUOYANT PELLET COVERING FOR SWIMMING POOLS

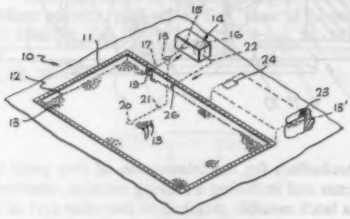
Robert V. Kelley, 837 Eton Dr., Burbank, Calif. 91504

Filed Apr. 6, 1977, Ser. No. 785,094
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **6 Claims**

1. A buoyant solar heating apparatus in combination with a pool for holding a body of water between opposite sidewalls and end-walls, comprising:

a plurality of separate individual solar heating units having a predetermined complimentary configuration for arrangement about the surface of said body of water so that adjacent ones of said units contact each other at the periphery of said adjacent units;

said bottom surface being translucent and said top surface being opaque whereby the short wavelength rays of the sun pass through said bottom surface for absorption by said body of water and the longer wavelength rays emitted by said body of water are blocked so that the short wavelength rays are readily converted to heat which is maintained on the surface of the body of water;



storage means for holding said plurality of solar heating units;

collection means connected between said body of water and said storage means for gathering said solar heating units;

dispersing means connected between said storage means and said body of water for returning said solar heating units to the surface of said body of water; and

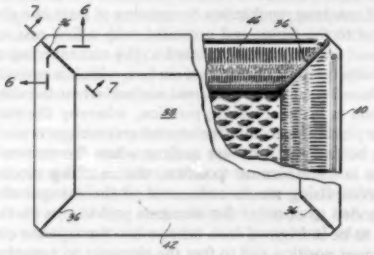
said storage means includes a below the surface of the ground container having an apertured grating separating an inlet duct connected to a skimmer and an outlet duct whereby said solar units collect on top of said grating during the collection mode of operation.

4,137,613

HEADLINERS FOR CASKETS

Joseph S. Ceresko, R.D. #3, Lake Ariel, Pa. 18436

Filed Jul. 20, 1977, Ser. No. 817,187
Int. Cl.² A61G *17/04*
U.S. Cl. 27—19 **8 Claims**



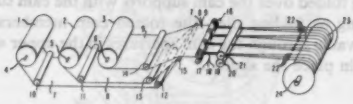
1. An improved liner adapted to be received and self-supported on an inwardly directed peripheral flange defining a liner receiving opening of a casket lid, the liner defining a casket interior and comprising a molded, unitary, self-supporting liner member molded from a single sheet of the thermoplastic material, the liner member having a central panel and a transversely extending apron, the apron defining at least one corner extending outwardly of and away from the panel having a recess at the corner extending outwardly of and away from the panel, the central panel and apron having an inner face and the recess opening therein, a layer of fabric adhering to the inner face of the panel and apron and conforming to the contour thereof, while excess portions of the fabric extend into the recess to provide the selected appearance of casket interior for the head lid.

4,137,614

PREPARATION OF A WARP BEAM WOUND WITH FLEXIBLE TAPES

Michael J. Wolstencroft, Kingston, Canada, assignor to Du Pont of Canada Limited, Montreal, Canada

Filed Mar. 10, 1977, Ser. No. 776,232
Claims priority, application Canada, Mar. 11, 1976, 247717
Int. Cl.² D02H *11/00*
U.S. Cl. 28—172 **10 Claims**



1. A process for preparing a warp beam wound with a plurality of tapes slit from at least two substantially continuous flat webs of flexible film superimposed upon each other, each web being at least 1 meter wide, said process comprising the steps of

(a) removing wrinkles from said webs of flexible film

(b) superimposing said webs

(c) slitting the superimposed webs longitudinally into a plurality of tapes

(d) feeding the superimposed tapes so formed through a pair of undriven nip rolls

(e) separating the superimposed tapes at the nip of said undriven nip rolls; each separated tape slit from one of the superimposed webs being arranged in the same plane with and in proximity to companion tapes slit from the other webs and the outer separation angle of the slit tapes being from 8° to 15°

(f) winding the separated tapes onto a driven warp beam

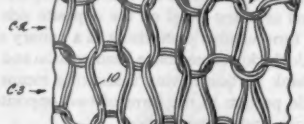
(g) applying tension to each web sufficient to give all of the tapes substantially the same tension at the warp beam.

4,137,615

PROCESS FOR TEXTURING BICOMPONENT YARN

Michael T. Webster, Madison, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jun. 1, 1977, Ser. No. 802,544
Int. Cl.² D04B *1/26*; D02G *1/00*
U.S. Cl. 28—218 **8 Claims**



1. A method for producing preshrunk continuous bicomponent thermoplastic yarns having increased pick and snag resistance when used to produce greige fabric, said method comprising the steps of:

knitting a tubular sleeve of continuous bicomponent thermoplastic yarn in greige form on a circular knitting machine having a revolving knitting head provided with less than four hundred needles;

controlling the tension on the yarn being supplied to the knitting machine so as to produce a predetermined number of crimps along the length of the yarn formed into the

tubular sleeve, the number of said crimps ranging from about 16 to about 24 crimps per thread line inch;

collecting the knit tubular sleeve in the form of a fabric roll and controlling the collection of the knit tubular sleeve so that the fabric roll has an internal diameter of at least eight inches;

autoclaving the fabric roll at a temperature ranging between about 212° F. to about 265° F. to equalize the temperature through the fabric roll so that the yarn therein will be equally heated for a period ranging from about 10 minutes to about 45 minutes so as to simultaneously shrink the yarn and set crimps therein; and

unraveling the knit tubular sleeve and collecting the pre-shrunk, crimped and set yarn.

4,137,616

METHOD OF PRODUCING A CLAD SHAPED BODY

Giswalt Veitl, and Ekkehard Auer, both of Linz, Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 16, 1978, Ser. No. 869,805

Claims priority, application Austria, Jan. 26, 1977, 452/77

Int. Cl.² B23P *3/14*; C23C *5/00*

U.S. Cl. 29—19 **8 Claims**

1. In a method of producing a clad shaped body of a base material comprised of steel and a cladding layer comprised of titanium by roll-bond cladding a sandwich-like cladding package closed on all sides, which cladding package, before being heated to rolling temperature, is evacuated, a metallic intermediate layer being provided between said base material and said cladding layer, the improvement comprising

covering said cladding layer with a pure iron sheet before making up said cladding package and at least where the cladding layer faces said base material, said pure iron sheet being said metallic intermediate layer,

evacuating said sandwich-like cladding package closed on all sides at a temperature of between 110 and 150° C. and

rolling said cladding package at a temperature range of between 650 and 750° C.

4,137,617

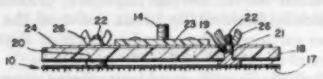
CIRCULAR GRATER FOR CUTTING PLASTIC

Rickey L. Newmayer, 25711 Frampton, Harbor City, Calif. 90710

Continuation-in-part of Ser. No. 831,381, Sep. 7, 1977, abandoned. This application Oct. 17, 1977, Ser. No. 842,520

Int. Cl.² B23D *71/00*

U.S. Cl. 29—78 **1 Claim**



1. A circular grater for cutting plastic for use in combination with a hand power-driven tool which has a motor within a housing and a shaft mechanically driven thereby and which includes:

a. a circular mounting member, mechanically coupled to the shaft so that it rotates thereon; and

b. a first flat disc-shaped member which is mechanically coupled to the circular mounting member; said circular grater comprises:

a. a second flat disc-shaped member having a first surface adapted for grating a plastic surface and a second surface;

b. a plurality of coupling members each of which having a disc-shaped head portion, which is mechanically coupled to said second surface of said second flat disc-shaped member, a cylinder-shaped portion of a particular diameter and a screw portion of a diameter smaller than the particular diameter, said coupling members adapted to have their said screw portions inserted into holes in the first flat disc-shaped member; and

c. a fastening means for fastening said plurality of coupling members in order to mechanically couple said second flat disc-shaped member to the first flat disc-shaped member.

4,137,618

FRICTION BEARING AND METHOD OF MAKING SUCH A BEARING

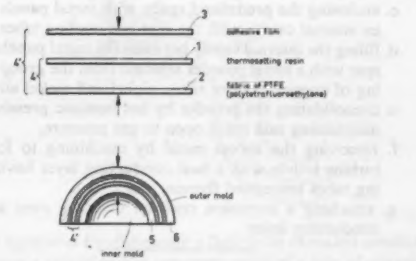
Dieter Krauss, Munich, Fed. Rep. of Germany, assignor to Erma-Werke Waffen- und Maschinenfabrik GmbH, Dachau, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 641,909, Dec. 18, 1975, abandoned. This application May 2, 1977, Ser. No. 792,781

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1974, 2460684

Int. Cl.² B21D *53/10*

U.S. Cl. 29—149.5 S **18 Claims**



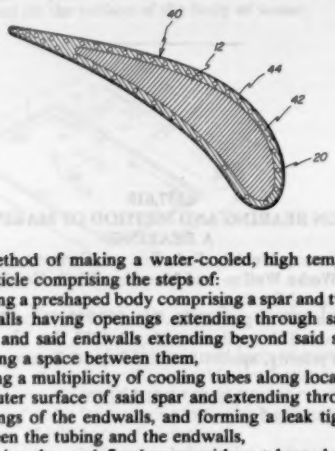
1. A method of making friction bearings comprising the following steps in sequence, preparing a laminate antifriction material by applying a thermosetting material in its A-state to one surface of a low friction coefficient webbing to form a coated webbing which initially retains the thermosetting material in its A-state, said webbing preventing said thermosetting material from penetrating through the webbing, then sandwiching under pressure said thermosetting material between said first mentioned webbing and a dry adhesive film, whereby said A-stage thermosetting material is protected by said low friction coefficient webbing on the one side and by said dry adhesive film on the other side, contacting the sandwiched, laminate antifriction material with tool means for pre-shaping said sandwiched, laminate antifriction material while said thermosetting material is still substantially in its A-state, by applying pressure to the antifriction laminate material through said tool means and by simultaneously applying heat to said antifriction laminate material also through said tool means, assemblying the pressure and heat pre-shaped antifriction laminate material with parts of a bearing and applying pressure and heat to the assembled bearing while simultaneously final shaping said antifriction laminate material, whereby said thermosetting material changes substantially from its A-state to its C-state by rapidly passing through its B-state and wherein the tackiness of said A-state is neutralized by said sandwich formation.

4,137,619

METHOD OF FABRICATING COMPOSITE STRUCTURES FOR WATER COOLED GAS TURBINE COMPONENTS

Adrian M. Beltran, Ballston Lake; Myron C. Muth, Amsterdam, and William F. Schilling, Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,726
Int. Cl.[2] B23P *15/04*
U.S. Cl. 29—156.8 H **10 Claims**



1. A method of making a water-cooled, high temperature turbine article comprising the steps of:

a. forming a preshaped body comprising a spar and two rigid endwalls having openings extending through said endwalls and said endwalls extending beyond said spar and defining a space between them,

b. placing a multiplicity of cooling tubes along locations on the outer surface of said spar and extending through the openings of the endwalls, and forming a leak tight joint between the tubing and the endwalls,

c. enclosing the predefined space with metal panels to form an internal cavity with the spar and cooling tubes therein;

d. filling the internal cavity between the metal panels and the spar with a metal powder selected from the group consisting of copper, copper alloy, nickel and nickel alloy,

e. consolidating the powder by hot isostatic pressing while maintaining said tubes open to gas pressure,

f. removing the excess metal by machining to form said turbine article with a heat conducting layer having cooling tubes embedded therein; and

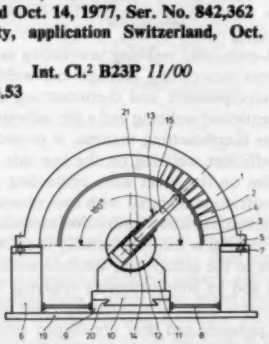
g. attaching a corrosion resistant cladding over said heat conducting layer.

4,137,620

APPARATUS FOR CONNECTING A COVER BAND TO GUIDE BLADING OF A TURBOMACHINE

Julius Beusing, Baden, Switzerland

Filed Oct. 14, 1977, Ser. No. 842,362
Claims priority, application Switzerland, Oct. 14, 1976, 12984/76
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—243.53 **8 Claims**



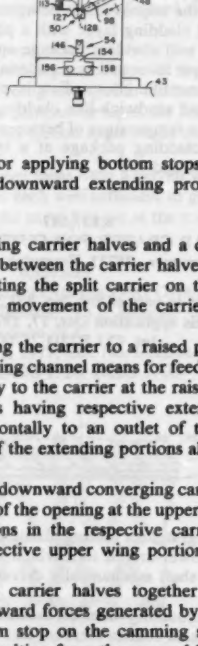
1. A riveting machine for connecting semi-cylindrical cover bands to the head ends of guide blading provided with rivet spigots at any point within a blade-carrying semi-cylindrical turbine component which comprises a radially adjustable riveting arm mounted for rotation within a plane normal to the cylinder axis about a pivot axis coaxial with that of the cylinder, and a riveting group carried at the outer end of said arm, said riveting group including a rotatable riveting spindle engageable with the end of the spigot and an associated mechanism for pressing said cover band against the head ends of said guide blading while said rotatable riveting spindle works a head onto the spigot.

4,137,621

APPARATUS AND METHOD OF APPLYING STAPLE-LIKE BOTTOM STOPS TO SLIDE FASTENERS AND THE LIKE

George J. Scagnelli, Meadville, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Aug. 25, 1977, Ser. No. 827,699
Int. Cl.[2] B29D *5/00*
U.S. Cl. 29—408 **7 Claims**



1. An apparatus for applying bottom stops having upper wing portions and downward extending prongs to a slide fastener comprising

a support,

a split carrier having carrier halves and a central vertical opening formed between the carrier halves,

shaft means mounting the split carrier on the support for allowing sliding movement of the carrier upward and downward,

spring means biasing the carrier to a raised position,

a gravity chute having channel means for feeding the bottom stops sequentially to the carrier at the raised position,

said carrier halves having respective extending portions projecting horizontally to an outlet of the chute with upper surfaces of the extending portions aligned with the channel means,

said carrier having downward converging camming surfaces at the top edges of the opening at the upper surfaces of the extending portions in the respective carrier halves for seating the respective upper wing portions of a bottom stop,

means biasing the carrier halves together with a force greater than outward forces generated by the wing portions of a bottom stop on the camming surfaces of the carrier halves resulting from the upward bias of the carrier,

a ram aligned with the central opening in the carrier,

an anvil mounted on the support beneath the carrier and the ram and having means for crimping the prongs of the bottom stop,

means mounting the ram on the support for moving the ram upward and downward such that during downward movement the ram engages the top of the bottom stop, moves the bottom stop and the carrier simultaneously down to a slide fastener positioned on the anvil, pushes the bottom stop between the carrier halves, and forces the

prongs of the bottom stop through the slide fastener and against the crimping means of the anvil to crimp the prongs and secure the bottom stop to the slide fastener, and

said carrier halves have respective inner vertical surfaces extending downward from the camming surfaces for guiding the bottom stops until engagement with slide fasteners and have respective inner diverging surfaces extending downward from the vertical surfaces.

5. A method of applying a bottom stop with upper wing portions and downward extending prongs to a slide fastener comprising the steps of

biasing a split carrier upward by means of a spring,

feeding a bottom stop to the upwardly biased split carrier so that the wing portions of the bottom stop are seated against downwardly converging camming surfaces formed on inner edges of respective carrier halves of the split carrier,

moving a ram downward into engagement with the top of the bottom stop,

biasing the carrier halves together with a force greater than the outward camming force generated by the wing portions of the bottom stop on the camming surfaces of the carrier halves resulting from the upward bias of the split carrier,

continuing downward movement of the ram to move both the bottom stop and the split carrier downward against the upward bias of the split carrier to just above the slide fastener,

stopping the movement of the split carrier at the slide fastener.

further continuing downward movement of the ram to move the bottom stop downward forcing the carrier halves apart,

guiding the bottom stop during said further continuing downward movement of the ram between inner vertical surfaces of the respective carrier halves after passing the camming surfaces and until engagement of the prongs with the slide fastener,

crimping the prongs by anvil means during said further continuing downward movement between downwardly diverging relieved inner surfaces of the respective carrier halves permitting free bending of the bottom stop without engagement with the carrier halves,

raising the ram to disengage the bottom stop, and

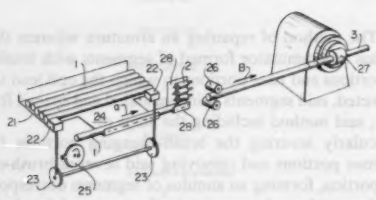
returning the split carrier to its raised position by means of the upward spring bias.

4,137,622

METHOD OF PREPARING A SUPPORT

Minoru Maekawa, Yokohama, and Makoto Kurobe, Mito, both of Japan, assignors to Sekisui Jushi Kabushiki Kaisha, Osaka, Japan

Filed Dec. 16, 1977, Ser. No. 861,556
Claims priority, application Japan, Dec. 17, 1976, 51-152554
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—411 **5 Claims**



1. A process for preparing a support which includes metal pipes, resin plug means and resin tube means which comprises the steps of:

(a) taking a single metal pipe one by one from a plurality of pipes piled with their longitudinal axes being positioned parallel to one another and to a passage;

(b) taking a single a resin plug means one by one from a supply positioned in a direction transverse to the passage;

(c) placing a first pipe in said passage;

(d) intermittently transferring said first pipe in an axial direction and feeding another pipe into said passage with an interval being formed therebetween;

(e) interposing one said plug means in the interval between the pipes with the plug means axis aligned with the axes of said pipes;

(f) inserting each end of said plug means into corresponding ends of said pipes to form a continuum having a uniform diameter;

(g) feeding the continuum into a cross-head die mounted on an extruder;

(h) continuously covering the continuum with a synthetic resin; and

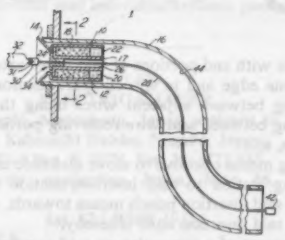
(i) cutting the resin covered continuum at a portion where said plug means is present to produce a separate support.

4,137,623

METHOD AND APPARATUS FOR DISPENSING FLUID IN A CONDUIT

Philip W. Taylor, Burnet, Tex., assignor to Taylor Industries, Inc., Marble Falls, Tex.

Filed Apr. 7, 1978, Ser. No. 894,565
Int. Cl.[2] B05C *7/08*; B05D *1/28*; B23P *19/04*
U.S. Cl. 29—433 **12 Claims**



1. An apparatus for dispensing a fluid in an extended conduit comprising a cartridge-like structure made of a pair of coaxial assembled separable inner and outer members disposed one within the other and insertable in an end of said conduit in a fixed position, means attaching the end of a pull strand to said inner member for separating said inner member from said outer member by pulling tension exerted by said pull strand, a resilient absorbent mass of cellular material supported by said inner member and normally compressibly held between said inner and outer member and capable when pulled from said outer member of expanding such as to be peripherally engaged with the wall of said conduit, means integral with the outer member adapted to retain said outer member in the conduit upon said separation, and a supply of said fluid associated within said structure and adapted to be applied to said conduit by said expanded cellular material when moved through said pull string.

4,137,624

APPARATUS FOR INSERTING WIRES INTO TERMINALS IN A CONNECTOR

Newton G. Davis, Harrisburg; James W. Hammond, Camp Hill, and Phillip E. Loomis, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 31, 1977, Ser. No. 846,732
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—566.1 **13 Claims**

1. Apparatus for inserting wires into the wire-receiving

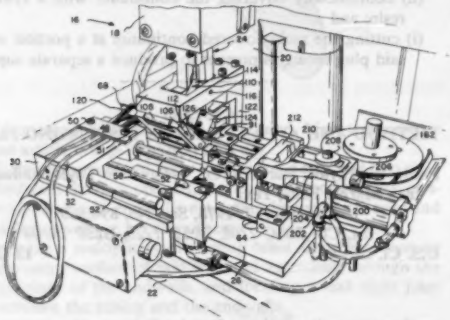
portions of electrical contact terminals which are contained in an electrical connector, said apparatus comprising:

an insertion zone, connector supporting means in said insertion zone for supporting an electrical connector,

insertion punch means normally spaced from a connector supported on said supporting means, said insertion punch means being movable relatively towards and away from said connector,

wire supporting slide means normally disposed at a loading station on one side of said insertion zone, said slide means being movable laterally from said loading station to an insertion station, said slide means having a wire supporting surface, said surface having one edge which is proximate to said insertion zone when said slide means is at said insertion station,

wire positioning means effective to locate wires on said



surface with end portions of said wires extending beyond said one edge and in spaced-apart relationship with the spacing between adjacent wires being the same as the spacing between said wire-receiving portions of said terminals, and

actuating means effective to move said slide means from said loading station to said insertion station and thereafter move said insertion punch means towards, and then away from, said insertion zone whereby,

upon placement of a connector on said connector supporting means, placement of said wires on said wire supporting slide means and actuation of said actuating means, said slide means moves to said insertion saation, said wires are positioned on said slide means with end portions of said wires in alignment with said wire-receiving portions of said terminals, and said end portions of said wires are inserted into said wire-receiving portions by said insertion punch means.

4,137,625

THIN FILM INTERCONNECT FOR MULTICOLOR IR/CCD

William J. White, Chelmsford, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 1, 1977, Ser. No. 829,744

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—577 C **14 Claims**

1. A method of forming a detector array on a substrate, the method comprising:

providing a substrate having a first surface with a plurality of rows of electrical contacts thereon;

attaching a body of first detector material to the first surface;

removing portions of the body to form a plurality of rows of first detector material, each row of first detector material being adjacent a row of electrical contacts;

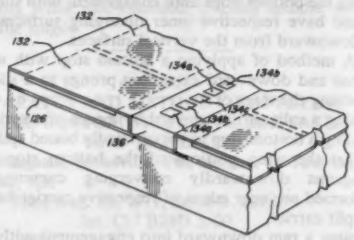
forming a plurality of individual detectors in each row of first detector material;

exposing the rows of electrical contacts;

forming rows of first level contact pads on the rows of electrical contacts, the first level contact pads extending above the first surface by a distance at least equal to the thickness of the detectors;

backfilling regions between rows of first detector material with a first insulating material;

removing portions of the first insulating material to form an



essentially coplanar second surface with the rows of first detector material, the second surface having the first level contact pads exposed; and

forming thin film interconnects over the second surface between the plurality of individual detectors and first level contact pads in an adjacent row.

4,137,626

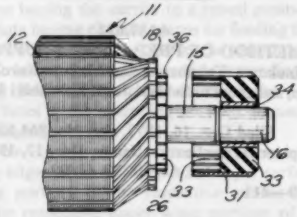
REPAIR OF ARMATURE COMMUTATOR

Cecil Farmer, Lake Belair, North Smithfield, R.I. 02895

Continuation-in-part of Ser. No. 799,371, May 23, 1977, abandoned, which is a division of Ser. No. 692,670, Jun. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 593,325, Jul. 7, 1975, abandoned. This application Feb. 13, 1978, Ser. No. 877,187

Int. Cl.[2] H01R *43/06*

U.S. Cl. 29—597 **4 Claims**



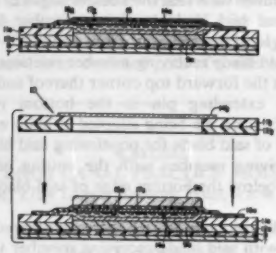
1. The method of repairing an armature wherein the armature has a commutator formed of segments with brush-engaging portions and riser portions to which the coil lead wires are connected, said segments being insulated and spaced from each other, said method including the steps of

circularly severing the brush-engaging portions from the riser portions and removing said severed brush-engaging portion, forming an annulus of segments corresponding to the number of segments in the removed brush-engaging portion, positioning said annulus adjacent that part of the commutator remaining after the removing step and electrically connecting each of said annulus segments to a respective riser portion to provide a replaced brush-engaging portion of the armature.

4,137,627
METHOD OF MAKING FLAT BATTERIES

Gordon F. Kinsman, Billerica, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 761,652, Jan. 24, 1977, abandoned. This application Nov. 18, 1977, Ser. No. 852,916
Int. Cl.[2] H01M *6/00, 6/46*
U.S. Cl. 29—623.4 11 Claims

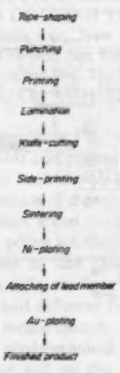


1. In the method of manufacturing a thin, flat laminar battery, the steps of forming a first thin, dry patch anode layer over a central region of the surface of a first sheet of liquid impervious conductive plastic material, extruding a layer of wet slurry cathode material over a surface of said sheet opposite said dry patch anode, temporarily heat sealing a cellophane separator to one surface of a liquid impervious thermoplastic frame over an opening formed in said frame adapted to receive said cathode slurry layer, placing the side of said frame opposite said separator in contact with said first sheet with said cathode slurry in said opening, coating the exposed surface of said separator with gel electrolyte, forming a second thin, dry patch anode layer over a central region of the surface of a second sheet of liquid impervious conductive plastic material congruent with said first sheet, and placing said second sheet over said frame with said second anode patch in registry and in contact with said gel electrolyte.

4,137,628
METHOD OF MANUFACTURING CONNECTION-TYPE CERAMIC PACKAGES FOR INTEGRATED CIRCUITS

Go Suzuki, Nagoya, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Dec. 19, 1977, Ser. No. 862,271
Claims priority, application Japan, Dec. 28, 1976, 52-157341
Int. Cl.[2] H05K *3/22, 3/10*
U.S. Cl. 29—625 4 Claims



1. A method of manufacturing connection-type ceramic packages for integrated circuits, each package having a cavity for accommodating an integrated circuit element therein, which comprises the steps of

(a) preparing a plurality of green ceramic sheets to be laminated;

(b) punching said green ceramic sheets to form notches for determining a working position in each sheet and recesses each defining said cavity at predetermined positions in each of given green ceramic sheets;

(c) printing a plurality of patterns of lead array, each pattern corresponding to terminal areas of said integrated circuit element, on the surface of each of the green ceramic sheets with a metallizing ink;

(d) laminating these printed green ceramic sheets one upon another while aligning said green ceramic sheets with the aid of said notches under hot pressed condition to form a green ceramic laminated body;

(e) providing transverse snap lines for obtaining individual ceramic package units on the surface of said green ceramic laminated body and at the same time longitudinally cutting said green ceramic laminated body into a plurality of green ceramic strips each constituting a plurality of said individual ceramic package units which are connected with each other;

(f) printing a pattern corresponding to said lead array pattern on both sides of each of said green ceramic strips with a metallizing ink;

(g) sintering said green ceramic strips to ceramic strips;

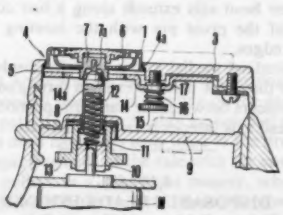
(h) subjecting said ceramic strips to a usual plating treatment; and

(i) attaching lead members to each of said plated ceramic strips to form connection-type ceramic packages capable of being divided into individual ceramic package units in use.

4,137,629
ELECTRIC SHAVER

Tadashi Yamazaki, Matsumoto, Japan, assignor to Izumi Seimitsu-Kogyo Kabushiki Gaisha, Nagano, Japan

Filed Sep. 8, 1976, Ser. No. 721,485
Claims priority, application Japan, May 26, 1976, 51-67215[U]
Int. Cl.[2] B26B *19/16*
U.S. Cl. 30—43.5 2 Claims



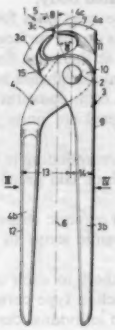
1. An electric shaver comprising, a housing having a head with an aperture therein, at least one slotted outer blade loosely fitted in said aperture, an inner blade disposed underneath said outer blade, a universal joint connected to said inner blade, spring means biasing said universal joint in a direction to resiliently push said inner blade into contact against the outer blade, an electric motor connected to said universal joint to rotate said inner blade, said outer blade having a depending portion which is at a lower level than said inner blade, and a cantilever plate fixed to said head and extending under said depending portion of said outer blade at a predetermined distance therefrom, said cantilever plate being provided with an adjusting screw and a spring around said screw for adjustably positioning said cantilever plate so as to provide said predetermined distance which is adjustable between said depending portion of said outer blade and the upper surface of the cantilever plate, whereby if a force which is stronger than the resil-

ient force of said spring means is applied to said outer blade to cause same to descend, said depending portion of the outer blade will be brought into contact with said cantilever plate, thus causing said plate by means of the last said spring to apply a resilient force to said outer blade to raise it up.

4,137,630
PINCERS

Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Werkzeug-Union GmbH-DWU, Wuppertal, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,371
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 7704068[U]
Int. Cl.[2] B26B *17/04*
U.S. Cl. 30—186 **8 Claims**

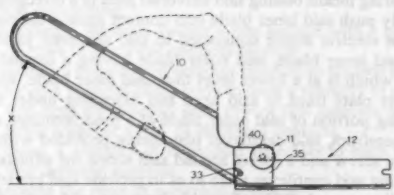


1. Pincers comprising:
(a) two pincer legs pivotally mounted on a pivot pin to move in a plane of movement about a common pivotal axis,
(b) each leg having a handgrip portion and a head portion,
(c) the head portions have respective cutting edges and extend toward each other in open arches and meet with their opposed cutting edges in cutting relationship,
(d) said head portions being formed asymmetrically with respect to each other and said cutting edges extend transversely with respect to said plane of movement,
(e) a pincer head axis extends along a line connecting the center of the pivot pin with the meeting point of the cutting edges,
(f) a longitudinal medial axis is laterally displaced with respect to the pivot pin and extends throughout the length of the pincers between the handgrip portions, and
(g) said head axis intersects said medial axis.

4,137,631
DISPOSABLE BLADE HOLDER

John E. P. Pickett, Durham, N.C., and Burton P. Franklin, Danville, Va., assignors to Triangle Biomedical Equipment, Inc., Durham, N.C.

Filed Feb. 13, 1978, Ser. No. 877,468
Int. Cl.[2] B26B *1/00*
U.S. Cl. 30—337 **1 Claim**

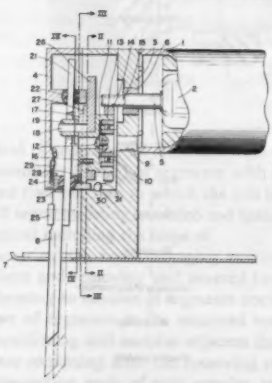


1. A blade holder for securely holding a flexible, rectangularly shaped, precision ground, single edge, notched end blade, said blade holder comprising:
(a) an elongated handle member shaped to fit comfortably in the hand when gripped and containing a recess at the top of its lower end for receiving the forefinger;
(b) a substantially rectangular shaped blade receiving member integral with and extending forward of said handle member and positioned in an angular relationship to said handle member such that the bottom edges of said handle member and said blade receiving member form an included angle in the range of from about 25° to 40°, and wherein said blade receiving member contains a threaded aperture in the forward top corner thereof and mounts an outwardly extending pin in the bottom rear corner thereof, with said pin being adapted to mate with a notch at one end of said blade for positioning said blade on said blade receiving member with the cutting edge thereof extending below the bottom edge of said blade receiving member;
(c) a removable rectangular cap member adapted to fit over and mate with said blade receiving member with an end segment of said blade sandwiched therebetween, said removable cap being of the same shape and dimensions as said blade receiving member and having a first aperture adapted to slidably receive the pin attached to said blade receiving member to position said cap over said blade receiving member and a second aperture adapted for alignment with the threaded aperture of said blade receiving member when said cap is in engagement with said pin; and
(d) a threaded thumbscrew angularly disposed relative to said blade receiving member by having the axis of said thumbscrew angled away from an axis perpendicular to the face of said cap member and adapted to securely clamp said blade between said blade receiving member and said cap when inserted through said cap second aperture and tightened into said blade receiving member threaded aperture.

4,137,632
JIG-SAW

Gerhard Pfanzer, Camberg, Fed. Rep. of Germany, assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Nov. 3, 1977, Ser. No. 848,057
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655583
Int. Cl.[2] B27B *11/02, 19/09*
U.S. Cl. 30—393 **21 Claims**



1. A power operated jig saw comprising:
a housing;

an elongated saw-blade holder for holding a saw-blade, the saw-blade holder defining a longitudinal axis;

bearing means for pivotally mounting said saw-blade holder in said housing;

drive means for reciprocating the saw-blade hoder in the direction of said longitudinal axis; and,

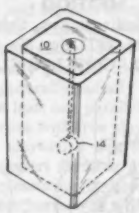
rotatable non-eccentric cam means operatively connected to said drive means for imparting a reciprocating movement to said saw-blade holder transverse to the reciprocating movement in said direction of said longitudinal axis whereby a saw-blade attached to said saw-blade holder will trace out an enclosed path of predetermined shape.

4,137,633

ROOT CANAL PRACTICE MODEL

Henry Kahn, 1724 Grand Bahama West, Palm Springs, Calif. 92262

Filed May 2, 1977, Ser. No. 792,694
Int. Cl.[2] G09B *23/28*
U.S. Cl. 32—71 **2 Claims**



1. In a device useful in the study of endodontia which comprises a block of transparent, machinable material, having a top face and a bottom end and a tapered cavity extending inwardly of said top face, the larger end of the cavity opening at said top face to receive a root canal file for reciprocating movement therein the improvement which comprises a resilient mass located and held solely at the bottom end of the cavity providing a cushioned stop resiliently limiting the inward stroke of the file during reciprocation thereof to simulate, through the student's tactile sense, the periodontal membrane of a natural tooth.

4,137,634

UNIVERSAL CUSTOM FIT GARMENT PATTERNS AND METHOD OF USING THE SAME

John Klamar, 600 Madison Ave., New York, N.Y. 10022

Continuation-in-part of Ser. No. 724,857, Sep. 20, 1976, abandoned. This application Jan. 21, 1977, Ser. No. 761,364
Int. Cl.[2] A41H *3/06*
U.S. Cl. 33—12 **3 Claims**

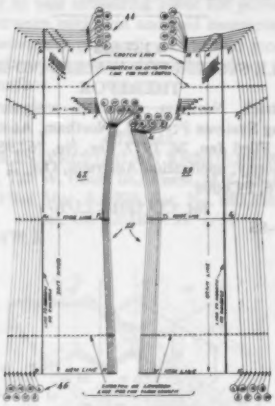
1. The method of customizing a universal garment pattern to exact figure measurements comprising the steps of:

providing a front and back master pattern which together form a complete pattern of a garment and include a series of graduated size lines about the periphery thereof and a series of reference points on the size lines of said master patterns, each series of size lines and reference points corresponding to a different figure measurement,

determining each of said different figure measurements,

marking said figure measurements on said front and back master patterns at predetermined points on said series of graduated size lines and on the interior of said master patterns corresponding to the different figure measurements to obtain a plurality of reference points, and

shaping said patterns by drawing a line between the selected reference points whenever said reference points are on different size lines, and



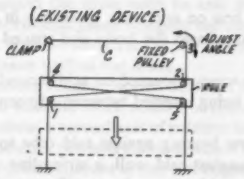
cutting said pattern along said shaped lines and graduated size lines corresponding to the different figure measurements.

4,137,635

STANDARD PARALLEL RULE WITH PERSPECTIVE DRAWING DEVICE

Douglas P. Harvey, 1654 Marshall No. 1, Houston, Tex. 77006

Filed Sep. 1, 1977, Ser. No. 829,952
Int. Cl.[2] B43L *13/14*
U.S. Cl. 33—77 **6 Claims**



1. Drafting apparatus of the type comprising a drawing board and a parallel rule slidably resting on the drawing board and having a pair of pulleys rotatably mounted to either end of the rule and a cord having its ends fixed to the drawing board below the respective ends of the rule with the cord extending between the pulleys in a criss-cross manner, wherein and in combination therewith the improvement comprises:

a first idler pulley assembly rotatably mounted to the drawing board above one end of the rule, the cord extending around said idler pulley;

primary and secondary pulleys rotatably mounted to the drawing board above the other end of the rule, the cord extending tautly around said secondary pulley;

drive means for causing said secondary pulley to rotate when said primary pulley rotates;

a second idler pulley rotatably mounted to the drawing board below said other end of the rule;

an auxiliary cable tautly engaging said primary pulley and said second idler pulley;

means for releasably attaching said auxiliary cable to said other end of the rule; and

means for releasably clamping the cord to the drawing board;

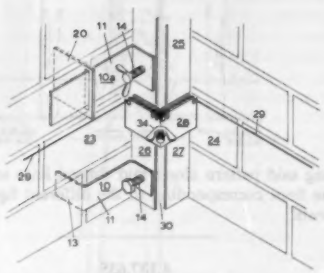
whereby when said auxiliary cable is attached to the rule and the cord is released, the rule moves up and down in an arc centered at a predetermined vanishing point, and when

said auxiliary cable is released and the cord is clamped, the rule moves up and down without changing orientation so that parallel lines can be drawn.

4,137,636
PROFILE SYSTEM FOR WALLS AND BRACKET THEREFOR

Johann Dietrich, Northam, Australia, assignor to Universal Bricklaying Systems Pty. Ltd., Northam, Australia

Filed Jan. 26, 1977, Ser. No. 762,955
Claims priority, application Australia, Oct. 2, 1975, PC3438; May 21, 1976, PC6006
Int. Cl.[2] G01C *15/10*
U.S. Cl. 33—85 **10 Claims**



1. Apparatus for establishing verticality in block wall construction, said apparatus comprising a rectangular-section tube to be set vertically and a bracket, said bracket including:
an elongated flat body having a longitudinal axis;
a first flat arm extending normal to the longitudinal axis of said body;
a second flat arm on said body extending in a plane normal to the plane of said flat body and spaced from said first arm;
an adjustable screw mounted on said second arm;
said first arm being inserted between adjacent blocks of said wall;
and said screw bearing against said tube to hold the tube vertically against said wall, a string-line carrier slidably mounted on said tube, and means for securing said carrier at any selected position along said tube, said carrier including two arms arranged in L-shape and having a longitudinal slot in the upper surface of each arm joining a transverse slot in the extremity of that arm.

4,137,637
CARPENTER'S PORTABLE PRECISION ADJUSTABLE LENGTH CUTTING GAUGE

Wilbur Kessler, 3621 Boyd St., Midland, Tex. 79703

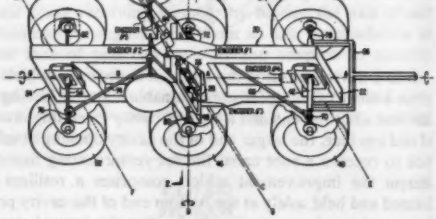
Filed Oct. 26, 1977, Ser. No. 845,552
Int. Cl.[2] B43L *7/06*
U.S. Cl. 33—94 **2 Claims**

1. In the art of carpentry through the use of hand-powered cutting tools, a portable elongated cutting gauge which is conformable to a workpiece of rectangular dimensions, the elements comprising in relative coactive relationship;
(A) an elongated and graduated extruded aluminum rule formed of connected vertical and horizontal flanges, said flanges being adapted to engage corresponding vertical and horizontal portions of a workpiece;
(B) a two-sided precision marker, one side of which lies contiguous and coplanar with the top of the horizontal flange of the rule and which is settable in overlying relation to the rule, the other side of the marker depending vertically opposite the vertical flange of the rule, said marker bearing a first setting means which is engageable with the horizontal flange of the rule;
(c) an adjustable elongated workpiece stop block, mounted contiguous the inside of the vertical and horizontal flanges of the rule, said stop block and said marker mounting a second setting means to place the stop block in adjustable contact with the marker, said stop block being independently moveable relative to the rule; and
(D) an angular guide for the saw, swivel mounted between its ends and at one end of the rule and an adjustably graduated arm thereon, connecting guide and rule for presetting the angle of the guide relative to the rule and the marker.

4,137,638
ELECTROMECHANICAL SURVEY VEHICLE AND METHOD

Robert G. Watts, 3803 Sullivant Ave., Columbus, Ohio 43228

Filed Sep. 26, 1977, Ser. No. 836,722
Int. Cl.[2] G01B *7/00, 7/28*
U.S. Cl. 33—141.5 **24 Claims**



3. A surveying vehicle comprising:
a first member movably supported on a surface;
a second member movably supported on the surface, said second member being pivotable with respect to said first member about a first axis and a second axis, nonparallel to the first axis;
means for generating a first signal responsive to the vehicle having been moved a predetermined distance; and
means for measuring, responsive to said first signal, changes in angular orientation of said second member with respect to said first member about said first and second axes;
wherein, as the vehicle is moved along a path on the surface, data is provided from which three dimensional coordinates of the path are calculated.

14. A survey vehicle apparatus for providing survey data for a path on a surface along which the vehicle is moved, comprising:
a first member supported by at least one surface engaging wheel, said first member having a reference axis;
a second member, having a reference axis and supported by at least one surface engaging wheel;
means for coupling said first member to said second member to permit the orientation of the reference axes to vary responsive to changes in direction of the vehicle and changes in the elevation of the surface, encountered in movement along the surface; and
means for measuring changes in the orientation of the reference axes of the first and second members with respect to one another.

4,137,639

DEVICE FOR THE MEASUREMENT OF THE WALL THICKNESS OF TUBES

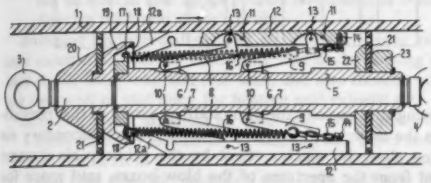
Heinz Zumbach, Biel, Switzerland, assignor to Zumbach Electronic AG, Orpund, Switzerland

Filed Dec. 8, 1977, Ser. No. 858,853

Claims priority, application Switzerland, Dec. 22, 1976, 16169/76

Int. Cl.[2] G01B 7/06

U.S. Cl. 33—147 L 11 Claims



1. A device for measuring the wall thickness of tubes, including a common support member defining an axis for insertion within the tube, a plurality of parallelogram linkage means connected between said support member and a corresponding plurality of elongated measuring bodies, said linkage means being arranged around said support for supporting said measuring bodies generally parallel to said axis and permitting movement thereof generally radially with respect to said support member axis, at least one parallelogram arm connected in each said linkage means with free play such that the respective measuring body is allowed a degree of angular movement relatively to said support member axis, and means for resiliently urging said measuring bodies radially outwardly into contact with the inner surface of a tube wall.

4,137,640

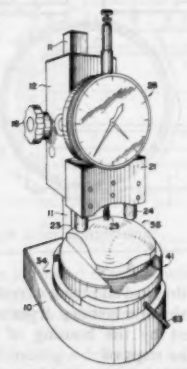
GAUGE FOR LENS LAPPING TOOLS OR THE LIKE

Stanley M. Parks, c/o OPT-TECH, Osborn Building, 1020 Huron Rd., Cleveland, Ohio 44113

Filed Dec. 19, 1977, Ser. No. 862,115

Int. Cl.[2] G01B 5/20, 3/22

U.S. Cl. 33—174 A 14 Claims



1. A gauge for measuring curvature of an item having a curved surface, comprising a base, measuring means mounted on said base, support means on said base for supporting said item for engagement of the curved surface thereof by said measuring means, said measuring means including a pair of fixed gauging surfaces engageable with said curved surface at first and second spaced points, and sensing means locating said curved surface at a third point spaced from said first and second points, all of said points being contained in a measuring plane, said sensing means being operable to determine the position of said third point with respect to said first and second points and thereby providing a determination of the curvature of said curved surface along the intersection thereof by said measuring plane, and guide means extending substantially perpendicular to said measuring plane for providing relative movement between said item and said measuring means in a direction substantially perpendicular to said measuring plane so that said plane intersects said surface along an equator of said curved surface.

4,137,641

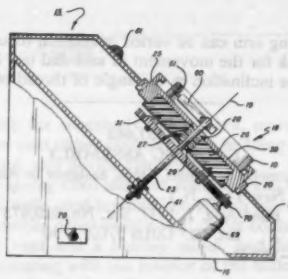
MEANS FOR INSPECTING AN ANNULAR WORKPIECE

Angelo Lauri, 725 W. Court St., Rome, N.Y. 13440

Filed Mar. 6, 1978, Ser. No. 883,698

Int. Cl.[2] G01B 7/31, 7/34

U.S. Cl. 33—178 E 20 Claims



1. Apparatus for inspecting an annular work element for variations in concentricity and wall thickness including

an open ended drum for receiving an annular work element therein, the inner circular wall of the drum being concentric with the central axis of the drum,

means to support the drum with its axis at an acute angle with the horizontal plane whereby the outer circular wall of a work element supported in the drum rests in contact with the inner wall of the drum,

means to produce relative motion between the drum and the work such that the work rotates in rolling contact with the drum about a second axis of rotation within said drum,

a probe mounted a predetermined distance from the central axis of the drum adjacent to one rotating wall of said work and having a sensing means associated therewith for providing a discernible signal in the event the probe touches the wall of the work.

4,137,642

TOOL FOR CONTROL MEASUREMENT OF GEARS

Harald Halvarsson, Finsporg, Sweden, assignor to Stal-Laval Turbin AB, Finsporg, Sweden

Filed Nov. 14, 1977, Ser. No. 851,314

Claims priority, application Sweden, Nov. 12, 1976, 7612633

Int. Cl.[2] G01B 5/20

U.S. Cl. 33—179.5 D 2 Claims

1. A tool for control measurement of the correct involute form of the teeth of a helical gear wheel, comprising

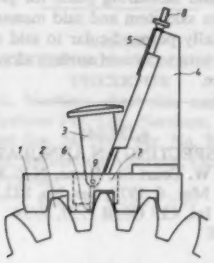
(a) a dial test indicator mounted for movement along a linear path;

(b) a pivotally movable measuring arm having a point thereon, on said dial test indicator;

(c) a rack having the same pitch as the teeth of said helical gear wheel;

(d) a bracket including means defining said linear path on which said dial test indicator is so located in relation to the teeth of said rack that, during measuring, the point of said measuring arm engages a tooth of said helical gear wheel; said bracket having an aperture therein permitting said point of said measuring arm to contact said tooth;

(e) means for mounting said bracket on said rack;
(f) said dial test indicator being adjustably mounted on said bracket, whereby the height position of the point of said

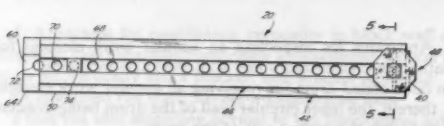


measuring arm can be varied in relation to said rack, and the track for the movement of said dial test indicator has the same inclination as the angle of thread of said rack.

4,137,643
GAUGING ASSEMBLY

Edwin L. Carmel, Cincinnati, Ohio, assignor to American Standard Inc., New York, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,673
Int. Cl.[2] G01B 5/02, 3/30
U.S. Cl. 33—180 R **13 Claims**



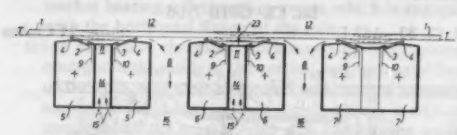
1. A gauging assembly adapted for use in positioning stock material with respect to fixed equipment comprising:
an elongated retainer having at least one stop position thereon;
at least one stop block having a plurality of material engaging faces and being positionable to expose each face in sequence for engagement with stock material;
a connector for removably positioning the stop block at the stop position on the retainer to prevent rotation of the stop block and permitting displacement laterally away from said retainer to a position permitting rotation of the stop block with respect to said stop position to expose successive faces;
indicia means for indicating the position of the exposed face of the stop block;
mounting and retaining means adapted to mount the retainer to the fixed equipment so that rotation of the stop block provides a variety of longitudinal adjustments for the positioning of the material engaging face of the stop block and accordingly determining the position of the stock material with respect to the fixed equipment.

4,137,644
TREATING AIRBORNE WEB MATERIAL

Ingemar Karlsson, Växjö, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Nov. 30, 1976, Ser. No. 746,093
Claims priority, application Sweden, Dec. 9, 1975, 7513864
Int. Cl.[2] F26B 13/20
U.S. Cl. 34—23 **7 Claims**

1. A method for treating airborne web material passing through an installation where air is supplied at elevated pressure through pairs of spaced apertures arranged in the upper surface of blow-boxes disposed along the conveying path of the material, which apertures have openings which are designed to eject the air in pairs of streams facing away from each other and along the path of travel of the web, whereby in the space between said apertures a static underpressure in relation to the pressure on the upper surface of the material tends to arise and to cause deflection of the material, said method reducing said deflection and comprising separately supplying to said space between the apertures a great volume of secondary

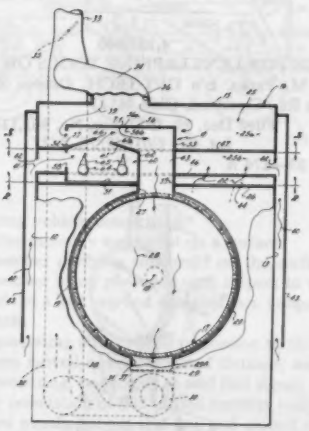


air having substantially the same static pressure as that prevailing on the upper surface of the material, which secondary air is taken along by ejector effect by the primary air streams ejected from the apertures of the blow-boxes, said space for supplying secondary air being substantially greater than the total flow area of said aperture openings so that said secondary air is supplied through said space between said apertures without substantial restriction, to maintain said same static pressure.

4,137,645
LAUNDRY DRYER

Norman J. Bullock, Prospect, Ky., assignor to W. M. Cissell Manufacturing Company, Louisville, Ky.

Division of Ser. No. 716,185, Aug. 20, 1976, Pat. No. 4,065,253.
This application Sep. 12, 1977, Ser. No. 832,249
Int. Cl.[2] F27B 7/36
U.S. Cl. 34—35 **4 Claims**



1. A method of heating and admixing a fresh make-up air and recirculated exhaust air for a laundry dryer with a drum in an attic chamber defined by the housing of said dryer, said method comprising the steps of
locating a heat transfer chamber within said attic chamber, said heat transfer chamber including a heat source, said attic chamber being defined by said dryer housing's roof, side walls, front wall and rear wall, and by a floor spaced beneath said roof,
sub-dividing said attic chamber into an upper portion for receiving recirculated exhaust air and a lower portion for receiving fresh make-up air, said upper and lower portions being defined by a sub-floor that cooperates with said heat transfer chamber's side walls and with said attic chamber's walls, said upper and lower portions of said attic chamber being heated by heat introduced into said heat transfer

chamber, said lower portion having an inlet in one of said dryer housing's walls, and said heat transfer chamber having an inlet located in said lower portion,

positioning a heat transfer and feed duct partially in said upper portion and partially in said lower portion, said duct having one section partially defined by said heat transfer chamber's roof, and one section partially defined by one of said heat transfer chamber's side walls, for heating said duct, said heat transfer chamber having an outlet in its roof that opens directly into said duct, and said duct having an inlet in said upper portion and an outlet connected directly with said dryer's drum,

directing recirculated exhaust air into said upper portion, said exhaust air thereby contacting said dryer housing's roof, said walls, front wall and rear wall, and also thereby contacting one wall of said duct, for heating said exhaust air,

directing fresh make-up air into said lower portion, said fresh make-up air thereby contacting said dryer housing's sidewalls, front wall and rear wall, also thereby contacting said heat transfer chamber's side walls, and also thereby contacting one wall of said duct, for heating said make-up air, thereafter directing said fresh make-up air into said heat transfer chamber's inlet for further heating said make-up air, and then out of said heat transfer chamber's outlet into said duct,

directing said recirculated exhaust air into said duct for further heating of said exhaust air, said heated exhaust air being admixed with said heated make-up air within said duct, and

thereafter exhausting said heated and admixed recirculated and exhaust air into said dryer's drum.

4,137,646

DRUM-TYPE DRIER FOR FABRIC

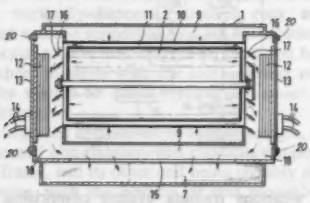
Heinrich Führing, Augsburg, Fed. Rep. of Germany, assignor to Böwe Böhler & Weber KG, Augsburg, Fed. Rep. of Germany

Filed Jun. 14, 1977, Ser. No. 806,462

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 7618897[U]

Int. Cl.[2] F26B *11/02*

U.S. Cl. 34—75 **7 Claims**



1. A drum-type drier comprising:

a housing;

a drying drum journaled in said housing for rotation about a horizontal axis;

means for feeding a textile web over the periphery of said drum;

means for distributing a drying gas over said web, said housing being formed with a pair of walls each juxtaposed with an end of said drum and disposed along said axis, at least one of said walls forming a door affording access to the interior of said housing; and

a cooler for said gas lying along said axis between an inner surface of said door and the respective end of said drum and rendered accessible upon opening of said door, said cooler being formed with inlet and outlet fittings for a coolant adapted to traverse said cooler, said fittings extending through said door, said drum having a perforated cylindrical periphery traversed by said gas and said end of said drum being formed with windows open toward said cooler, the axis intersecting the cooler.

4,137,647

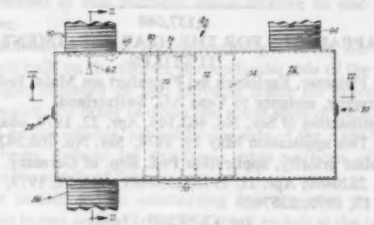
HEAT AND HUMIDITY RECOVERY DEVICE FOR USE WITH CLOTHES DRYER

James N. Clark, Jr., 4784 Brooklyn, S.E., Grand Rapids, Mich. 49508

Filed Sep. 6, 1977, Ser. No. 830,406

Int. Cl.[2] F26B *19/00, 21/06*; B01D *39/00, 50/00*

U.S. Cl. 34—82 **8 Claims**



1. A device for selectively venting hot, moist air from a clothes dryer vent either exteriorly of a building or interiorly of the building, said device comprising:

a housing having front and rear walls, top and bottom walls and end walls, said housing defining an inlet connectable to the clothes dryer vent; a vent outlet connectable to an exterior vent and a heating outlet, said heating outlet communicating with the interior of the building;

valve means for closing off said vent outlet so that the hot, moist air from said inlet passes through said housing to said heating outlet, said valve means comprising a nonporous foam plug dimensioned to plug and effectively seal said vent outlet; and

staged filtration means supported within said housing for filtering the hot, moist air as it passes from said inlet to said heating outlet, said staged filtration means including a coarse reticulated foam filter for removing large particles, a medium reticulated foam filter for removing intermediate size particles and a fine reticulated foam filter for removing small particles, said filters each being depth build-up filters, said filtration means further including filter support means carried by said housing for supporting each of said filters and maintaining a tight seal between said filters and the interior of said housing and said filters being positioned within said housing so that the hot, moist air passes serially through the coarse filter, the medium filter and then the fine filter to said heating outlet.

4,137,648

DRIERS FOR TEXTILE MATERIALS

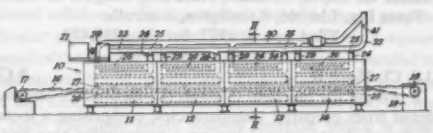
Eric S. Rhodes, Harrogate, England, assignor to E. Gordon Whiteley Limited, Morley, England

Filed Apr. 18, 1977, Ser. No. 788,667

Claims priority, application United Kingdom, Apr. 26, 1976, 16860/76

Int. Cl.[2] F26B *13/02*

U.S. Cl. 34—86 **3 Claims**



1. A stenter for drying textile materials, comprising a casing having successive chambers therein, chains for feeding the material to be dried through said successive chambers in the casing, an electric motor connected to drive the chains, a gas turbine engine, trunking for feeding exhaust gas from said gas

turbine engine into said casing, an electrically driven fan in each said chamber for circulating hot gas within the casing, an alternator driven by said gas turbine engine and providing electrical power for said electric motor and said fans, a heat exchanger in each said chamber, passages connecting said heat exchangers to the trunking, valves in said passages for controlling the temperatures in said chambers, an outlet for exhaust gas from said trunking and a valve controlling said outlet for maintaining a back pressure in said casing.

4,137,649

APPARATUS FOR THE HEAT TREATMENT OF TEXTILES

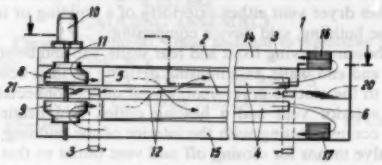
Hans Fleissner, Egelsbach bei Frankfurt am Main, Fed. Rep. of Germany, assignor to Vepa AG, Switzerland

Continuation of Ser. No. 463,146, Apr. 22, 1974, abandoned. This application May 19, 1978, Ser. No. 768,382

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1973, 2320480; Apr. 21, 1973, 2320481; Apr. 21, 1973, 2320479; Nov. 17, 1973, 2357459

Int. Cl.[2] F26B *13/00*

U.S. Cl. 34—158 **21 Claims**



1. An apparatus for the heat treatment of a textile material arranged to extend in a plane, especially a tenter frame device for the heat treatment of a passing length of textile material, which comprises several nozzle boxes arranged transversely across the operating width of said textile material at spaced intervals from one another, said nozzle boxes being fed with heated air through openings at front end faces and having openings discharging the heated air in a direction toward the length of textile material, a fan being disposed at the feed openings of said nozzle boxes, said fan being a radial-flow fan and being arranged, with its axis of rotation, at right angles to the plane of the length of textile material on a longitudinal side of the apparatus whereby said heated air is introduced directly into said nozzle boxes from said longitudinal side parallel to the plane of said length of textile material, the air flowing from the nozzle boxes onto the textile material being then discharged between said spaced nozzle boxes in the same flow direction to the other longitudinal side of the apparatus and being returned, after deflection and heating, to the fan by way of a duct formed therebetween, and a heating unit being provided at the other longitudinal side that is readily accessible from the outside of said apparatus, said fan deflecting the heated air returning via said duct by 180°.

4,137,650

TEACHING AID

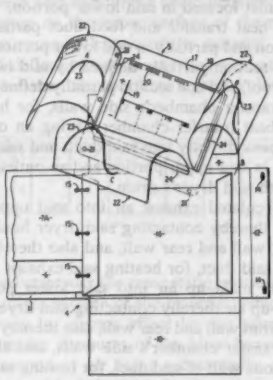
Francis G. Hayes, Mosman, Australia, assignor to Clarendon Press Pty. Limited, Kensington, Australia

Filed Apr. 7, 1977, Ser. No. 785,472

Int. Cl.[2] G09B *1/12*

U.S. Cl. 35—8 R **9 Claims**

1. An aid for teaching through the medium of images projected from prepared transparencies, comprising a loose-leaf binder of sheet material having a rectangular base and four lateral flaps foldable over the base to form a box-like container, cooperating means on a pair of opposite flaps for securing the binder in a closed condition, loose-leaf securing means attached to one flap within the binder, a stack of open-mouthed envelopes mounted upon the securing means, a plurality of said transparencies accommodated in a predetermined sequence within said envelopes, and one or more volumes of text also mounted in a stack upon the securing means adjacent the



envelopes and providing information as to respective commentaries by a teacher to accompany projected transparencies.

4,137,651

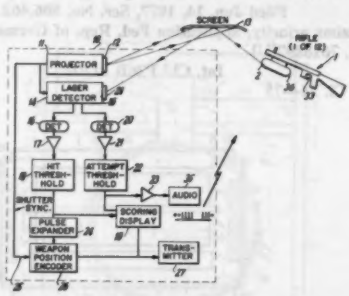
MOVING TARGET PRACTICE FIRING SIMULATOR

Herman Pardes, Wanamassa; Frederick B. Sherburne, Oceanport, and Joseph R. Schwartz, Toms River, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 728,331, Sep. 30, 1976, abandoned. This application May 19, 1978, Ser. No. 907,369

Int. Cl.[2] F41G *3/26*; F41J *9/00*

U.S. Cl. 35—25 **9 Claims**



1. A weapons training system comprising a projection screen, at least one weapon on which is mounted a laser means producing a laser beam which simulates the fire of a weapon and which is controlled by the operator of said weapon to direct said beam at said screen, a projector, a first film within said projector having target scenes, said projector projecting said scenes onto said screen, a laser beam detector positioned adjacent to and spaced from said projector for receiving laser beam radiation reflections from said screen, a second film contained within said detector, said second film being substantially opaque to said radiation reflections from said laser beam except for at least one area which is substantially transparent to said radiation reflections, said transparent area being placed to correspond with a selected target area of said target scene film, said projector and said laser detector having different and independent optical systems each directed at said screen so that the position of the second film corresponds and is aligned with the position of the projection of said target scenes on said screen to define said target area, film driving means, synchronizing means for advancing said first film synchronously with said second film, said synchronizing means including a frame

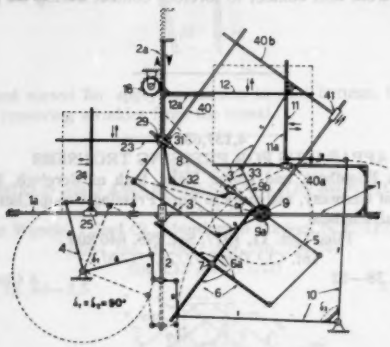
synchronization pulse generator within said projector and means applying pulses from said generator to said film driving means, and hit detector means within said laser beam detector responsive to said reflections of said laser beam from said screen and through said transparent area of said second film.

4,137,652

APPARATUS FOR VERIFICATION OF THE PYTHAGOREAN THEOREM

Rocco Riccardi, Via Gorizia, 7, Bari, Italy

Filed Nov. 7, 1977, Ser. No. 848,842
Claims priority, application Italy, Nov. 9, 1976, 2122 A/76
Int. Cl.[2] G09B *23/02*
U.S. Cl. 35—34 8 Claims



1. An apparatus for the comprehensive verification of the Pythagorean theorem by subdividing into five polygons the square built on the hypotenuse, with one of the polygons being a central square having an axis coaxial with the axis of the square built on the hypotenuse, and into four polygons the square built on the longer perpendicular side, of a right triangle, comprising:

a generally horizontally-disposed, fixed frame;

a vertically-slidable, generally vertically-disposed movable frame supported on said fixed frame, said movable frame having a vertically-disposed, toothed rack mounted thereon and a sleeve supported by a pin for rotation about an axis normal to said movable frame and fixed frame;

a toothed wheel in mesh with the teeth of said rack and operable by a knob to effect vertical movement of said movable frame;

a leg representing the hypotenuse of a right triangle, said leg having one end non-slidably- and rotatably-supported on said fixed frame, and its other end being slidably received in said sleeve, with the portion of said movable frame disposed between said sleeve and said fixed frame defining one perpendicular side of said right triangle and the portion of said fixed frame between said one end of said leg and said movable frame defining the other perpendicular side of said right triangle;

a system of three legs disposed in a U-shaped arrangement with adjacent legs at right angles to one another, said system having coupled to said leg representing said hypotenuse to define a square built on said hypotenuse, one of said legs representing the upper side of said square and the other two legs representing the left and right lateral sides of said square, respectively, with said leg representing said hypotenuse serving as the lower side of said square, at least one of said legs of said system being reciprocably movable relative to said other legs so as to vary the dimensions of said square when changing the effective length of said leg representing said hypotenuse effected by movement of said movable frame, which changes the included angle between said leg representing the hypotenuse and said fixed frame;

lever means for moving said at least one leg of said system, said lever means being responsive to movement of said leg representing said hypotenuse;

a vertically-disposed leg representing the west side of a square built on the shorter perpendicular side of the right triangle, supported for sliding movement on said fixed frame;

lever means for moving said leg representing the west side toward and away from said movable frame in response to movement of said movable frame relative to said fixed frame;

a horizontally-disposed leg representing a north side of a square built on the shorter perpendicular side of the right triangle, mounted on said movable frame for movement therewith, the other two east and south sides of the square built on the shorter, perpendicular side of the right triangle being defined by rectilinear edge portions of said movable and fixed frames, respectively;

a cross including two intersecting legs disposed at right angles to one another, rotatable about an axis at the center of the square built on the longer perpendicular side of the right triangle;

lever means for positioning said cross at the center of the square built on said longer, perpendicular side and for rotating said cross in direct response to rotation of said leg representing said hypotenuse, so that one of said legs of said cross is kept perpendicular, and the other leg of said cross is kept parallel, relative to said leg representing said hypotenuse;

a vertically-disposed leg representing a straight line segment passing through the mean point of the upper side of the square built on the hypotenuse, which leg is slidably supported on said fixed frame;

lever means for moving said vertically-disposed leg representing said straight line segment;

a horizontally-disposed leg representing a straight line segment passing through the mean point of the left side of the square built on the hypotenuse, which is rigidly mounted on said movable frame;

a plurality of polygonal panels in different colors relative to each of the geometrical figures obtained through the subdivision of the squares built on the sides of the right triangle, each of said panels being coupled to and movable with one of said legs;

a first board disposed parallel to, and behind of, said movable and fixed frames, said board being subdivided into various colored sectors which, in cooperation with said colored panels, define identical geometrical figures by the same color;

a second board, disposed parallel to, and in front of said movable and fixed frames, said board including a plurality of window openings, exactly delimiting in dimensions and position the squares built upon the sides of a right triangle having a maximum included angle of 45° formed by said leg representing said hypotenuse and said fixed frame portion representing said longer perpendicular side of said right triangle, the window opening positioned and dimensioned relative to the square built on said longer perpendicular side being at least partly occluded by a square panel of the same dimensions spaced behind and parallel to said second board, a sufficient distance to permit the legs of said cross to pass therebetween, said board also having a right triangular sector formed thereon, which is positioned and dimensioned to correspond to the dimensions of a right triangle having a minimum included angle of less than 45°; and

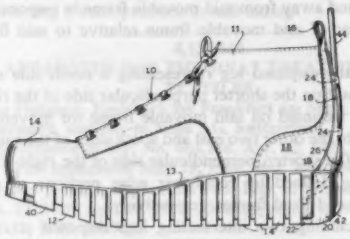
a third board, disposed parallel to and in back of said first board, which serves as a cover, said boards being spaced from one another in superimposed relation.

4,137,653

FOOTWEAR WITH SNORKEL VENTILATION

Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.

Filed Aug. 12, 1977, Ser. No. 823,960
Int. Cl.[2] A43B 7/06, 13/04
U.S. Cl. 36—3 B 1 Claim



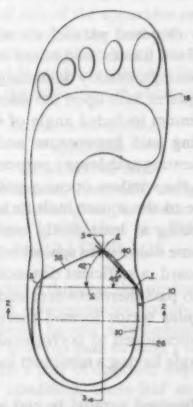
1. A snorkel shoe construction comprising
(a) a molded unit sole having top, side and bottom surfaces,
(b) a plurality of interconnected passages formed at said top surfaces,
(c) a manifold formed in said sole and communicating with said passages,
(d) a tread means formed at said bottom surfaces,
(e) an insole having perforations registered with said passages at said top surfaces,
(f) a foot enclosing upper secured to said unit sole about the periphery thereof,
(g) a snorkel tube anchored in said manifold and extending perpendicularly upwardly and outwardly along a vertical centerline of said upper, said upper and said sole being comprised of moisture and air impervious materials,
(h) said snorkel tube extending along said centerline and being supported in direct contact with rear surface portions of said upper, and
(i) said rear surface portions of said upper including a plurality of slits defining spaced integral straps for securing said snorkel tube along said centerline and in supportive contact with said upper.

4,137,654

FOOTWEAR DEVICE

Harry F. Hlavac, Mill Valley, Calif., assignor to Sports Safety, Inc., Mill Valley, Calif.

Filed Feb. 7, 1977, Ser. No. 766,039
Int. Cl.[2] A43B 5/04, 23/08, 21/36
U.S. Cl. 36—119 12 Claims



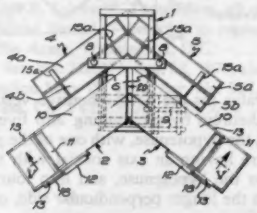
1. For use in footwear for a human foot, a device having a pair of upstanding laterally spaced side walls and an upstanding rear will integral therewith, a horizontally extending wedge integrally joined at its side edges with the lower margins of the side walls and integrally joined at its rear edge with the lower margin of the rear wall, said wedge having an upper surface which extends along a lateral declination in the range of substantially 4° to 5° from a horizontal supporting surface for controlling lateral angulation in frontal plane movement of the heel bone during locomotion, said side walls, real wall and wedge cooperating to define a cup-shaped pocket which is sized commensurate with the heel bone whereby during said locomotion the heel is held and stabilized in the pocket in an inverted position of substantially 4° to 5° from the supporting surface from heel contact to forefoot contact during the gait cycle.

4,137,655

APPARATUS FOR PRESSING TROUSERS

Wilhelm Engelbart, and Dieter Nahr, both of Bergisch, Fed. Rep. of Germany, assignors to Euro Pressing Group Limited, Kendal, England

Filed Oct. 11, 1977, Ser. No. 840,804
Int. Cl.[2] D06F 71/28, 71/40
U.S. Cl. 38—12 6 Claims



1. A trouser pressing apparatus comprising two lower pressing plates arranged at 90°–110° to each other, a carriage on which the lower pressing plates are mounted, clamps for securing the bottoms of the trouser legs to said plates and applying longitudinal tension thereto, means for applying vacuum to the plates to hold the trouser legs on the plates, means for moving the carriage, a pair of upper plates mounted above the lower pressing plates, said carriage being movable to position the lower plates beneath the upper plates, means for stretching the legs transversely and means for applying pressure and steaming said trousers.

4,137,656

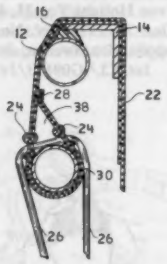
METHOD AND APPARATUS FOR TRANSPORTING CANVAS MURALS

John E. Scofield, Schooner Cove, Mariners La., Stamford, Conn. 06902

Filed Mar. 13, 1978, Ser. No. 885,795
Int. Cl.[2] D06C 3/08
U.S. Cl. 38—102.91 10 Claims

1. An assembly for mounting fabric based murals, which comprises:
a tubular frame having the general configuration of the mural and a size slightly smaller than the dimensions of the mural;
a flat bar member mounted on the frame, said flat bar member providing a flat surface against which the mural may be applied;

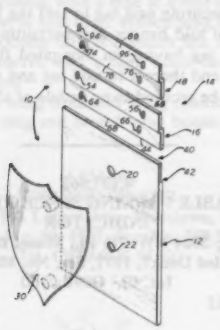
pockets provided in the peripheral edges of the mural, said pockets being folded over the frame;
battens located within said pockets; and



cord means for applying tension to said battens, thereby removing wrinkles from the mural.

4,137,657
SHIELD AND AWARD DESIGNATION MOUNTING DEVICE

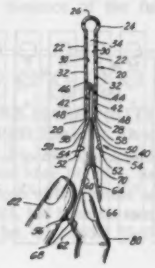
Peter Wardle, 1 Joel Ct., Huntington Station, N.Y. 11746
Filed Jan. 3, 1977, Ser. No. 756,349
Int. Cl.[2] A44C *3/00*
U.S. Cl. 40—1.5 **8 Claims**



1. A mounting device for a shield and/or award designations comprising:
(a) a first mounting means formed to receive and mount a symbol;
(b) a second mounting means formed to receive and mount a symbol;
(c) mating means formed on said first mounting means and said second mounting means to facilitate disposition of said first mounting means and said second mounting means in proximity to each other so as to present a unitary appearance with a substantially contiguous surface when so positioned; wherein said mating means includes a lap-type joint formed between said first mounting means and said second mounting means, said lap-type joint includes a groove formed along one edge of said first mounting means and a similar groove formed along one edge of said second mounting means, and wherein said groove on said first mounting means is formed along its upper edge and in the rear surface thereof, and said groove on said second mounting means is formed along its lower edge and in the face surface thereof, and wherein said second mounting means also includes a groove formed along the upper edge thereof and in the rear surface thereof for mating with the groove formed on the lower edge and face surface of another second mounting means; and
(d) adhesive securing means for securing said first mounting means and said second mounting means together when so disposed.

4,137,658
INDEX TAB

John L. Wos, 89-12 102nd St., Richmond Hill, N.Y. 11418
Filed Jun. 16, 1977, Ser. No. 807,199
Int. Cl.[2] A44C *3/00*
U.S. Cl. 40—2 R **10 Claims**



1. An index tab comprising
a unitary strip of material folded upon itself to form two slightly spaced and oppositely located walls in approximately parallel relationship joined at a fold line at the top end thereof and wherein said walls each terminate in a bottom end,
attaching means in the form of a doubled strip of flexible material arranged lengthwise within said unitary strip,
said strip having the sides thereof secured directly to said walls and being positioned below said top end of said unitary strip,
the lower end of each of said sides extending beyond said bottom end of each of said walls,
the lower ends of said side strips forming a pair of arms,
said inner surface of each one of said arms being coated with an adhesive material,
guard means interposed between said arms and disposed in face-to-face contacting relation with said adhesive coated surfaces of said arms,
said guard means comprising first and second guard sheets connected at their inner ends intermediate said arms,
said guard sheets being substantially coextensive with said adhesive coated surface of said arms and peelingly strippable therefrom, and
an extension portion extending downwardly from one of said guard sheets for removal of said guard means by grasping and pulling on said extension portion such that a peeling of said guard sheets from said arms occurs.

4,137,659
PERPETUAL CALENDAR

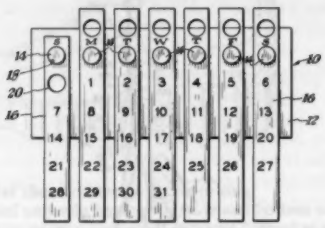
Michael A. Eddy, 810 Beech Ct., Plymouth, Mich. 48170
Filed Jul. 19, 1976, Ser. No. 706,576
Int. Cl.[2] G09D *3/00*
U.S. Cl. 40—107 **1 Claim**

1. A perpetual calendar comprising:
a rigid planar strip mounting surface, said mounting surface having indicia disposed thereon representing each day of a week on a calendar;
a plurality of mounting pegs, each peg connected to said mounting surface, with a singular peg being disposed in close proximity to a particular indicia representative of a single day of the week;
a plurality of transparent elongated strips, each of said strips having numerical indicia disposed thereon, said numerical indicia on each strip representative of particular days of a month on a calendar, each strip having numerical indicia

disposed in column array with the numerals disposed in value having values representative of a single day of the week for an entire month;

each of said strips having a pair of apertures disposed along the longitudinal axis of said strip, each of said apertures being engageable with a connecting peg for mounting each strip on a mounting peg, said strip covering said indicia on said mounting surface;

each of the numerals disposed on a single transparent strip being numerically spaced one week apart on a calendar



whereby each transparent strip is individually vertically disposable relative to said mounting surface to provide an array displaying a perpetual calendar in which the days of the month may be correctly displayed for any particular month of the calendar;

connecting means coupled to the transparent strips in proximal relationship to numerical indicia displaying the 29th, 30th, and 31st days of the month; and

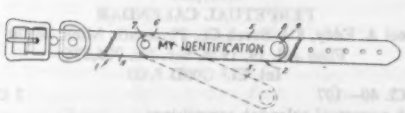
a plurality of opaque covers, each being engageable to said connecting means for covering respectively the 29th, 30th and 31st days.

4,137,660

IDENTIFICATION HOLDERS FOR DOGS AND CATS

Eileen A. Dettmann, Rte. 1, Box 109, Prairie View, Ill. 60069, and Arthur J. Thomas, 500 N. Greenwood Dr., Palatine, Ill. 60067

Filed May 19, 1977, Ser. No. 798,301
Int. Cl.[2] G09F *3/20*
U.S. Cl. 40—303 7 Claims



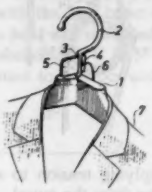
1. In an animal pet collar, an identification holder comprising a deep transparent plastic pocket having only its top end open, said pocket being permanently fastened to a portion of said collar on the outside thereof, an elongated flexible tag disposed in said pocket, said tag being adapted to carry identification indicia exposed to view through said transparent pocket, and a flexible strap overlying said pocket, means for fastening each end of said strap to said collar, said strap being fastened at its ends to said collar, at least the end of said strap at the open top of said pocket being demountably fastened whereby to provide visual and physical access to said tag.

4,137,661

IDENTIFICATION PROCEDURE FOR SUSPENDED ARTICLES OF CLOTHING AND CARRIER FOR APPLICATION OF THE PROCEDURE

Gert A. Johansson, von Holtens Vag 21, 443 00 Lerum, Sweden

Filed Dec. 30, 1976, Ser. No. 755,631
Claims priority, application Sweden, Jan. 19, 1976, 7600493
Int. Cl.[2] G09F *3/14*
U.S. Cl. 40—322 12 Claims



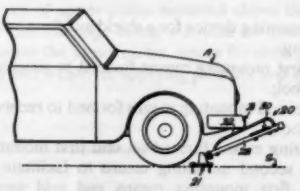
1. A marking system for articles of clothing comprising in combination: a hanger having a first portion adapted to hold an article of clothing and a second portion extending upwardly therefrom for attachment to a fixed support; a tag holder located on the upper portion of said hanger at a location above the level at which the article of clothing is supported thereon, a tag adapted to have selected information thereon relating to an article of clothing; said tag holder and said tag having means cooperatively securing said tag to said tag holder during normal handling of said hanger and permitting removal thereof manually, said tag having an elongated flexible tie element secured at one end thereof to said tag and means at the other end adapted to be secured to an article of clothing to which it refers.

4,137,662

DEFLECTABLE PARKING SPACE RESERVATION INDICATOR

Walter Baumer, 2304 NW. 7th Pl., Miami Beach, Fla. 33127

Filed Dec. 7, 1977, Ser. No. 858,443
Int. Cl.[2] G09F *7/00*
U.S. Cl. 40—612 11 Claims



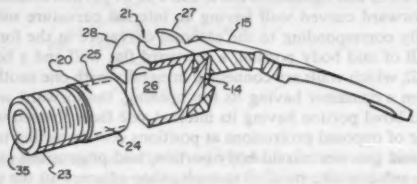
1. A reservation indicator for an individual parking space comprising a sign having a front facing surface bearing a message and being affixed to an upper end of a post resiliently supported in a normally upright vertical position, a base having a horizontal plate for attaching to the pavement of the parking space in a location requiring overriding by the front end of a car and deflection of the post from said vertical position to an inclined position, means mounted on said plate for said resilient support of said post, and slide-guard means associated with said post and sign adapted to be contacted and ridden along by the front bumper of the car during said overriding to effect said deflection permitting the car to completely enter said parking space and to prevent the sign and post from catching onto the car bumper and undercarriage when the car backs out of the parking space and the post returns to said vertical position.

4,137,663

COMPOSITE BREECH PLUG FOR BLACK POWDER GUNS

Leland A. Farber, Salt Lake City, Utah, assignor to Browning Arms Company, Morgan, Utah

Filed Jan. 13, 1978, Ser. No. 869,319
Int. Cl.[2] F41C *21/00*
U.S. Cl. 42—51 **11 Claims**



1. A black powder gun comprising:
a barrel with external flats, a caliber bore and a counter bore at the breech end defining an internal shoulder with the caliber bore;
an inner breech plug, including an internal firing chamber, a first portion threadly engaged within said counter bore to form a gas tight bore seal at said internal shoulder and a second portion extending from the breech end and concentric with the axis of said barrel;
a breech plug housing with a hole at a first end fit over said second portion of said inner breech plug so that said first end of said housing effects a match line with the breech end of said barrel, and a tang hook extending from a second end; and
a flash hole extending from said firing chamber through said inner breech plug and breech plug housing.

4,137,664

FISHING SINKER

William J. Beres, 142 Luther Ave., Hopelawn, N.J.

Filed Jan. 19, 1977, Ser. No. 760,537
Int. Cl.[2] A01K *95/00*
U.S. Cl. 43—43.1 **3 Claims**

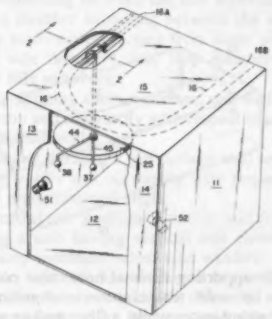
1. An assembly for use on a fishing line comprising:
(a) a sinker having a first passage through the body of the sinker which first passage is inclined downwardly at an angle to both the horizontal and vertical axes of the sinker;
(b) a second passage through the body of the sinker located in the same vertical plane as the first passage, which second passage is inclined downwardly at an angle to both the horizontal and vertical axes of the sinker in an orientation wherein the upper end of the second passage is on the same side of the sinker as the lower end of the first passage;
(c) an additional passage at the upper end of the sinker, distinct from the two passages in the sinker, for slidably attaching the sinker to a fishing line;
(d) a leader line slidably threaded through the first passage in the sinker from the top of the passage to the bottom and through the second passage from the top of the passage to the bottom;
(e) a fishing hook fixedly attached to the leader line remote from the sinker beyond the second downwardly inclined passage; and
(f) a split shot releasably attached to the leader line between the fishing hook and the sinker, which split shot can be fixed to the leader line at a variety of locations and whereby the location of the split shot on the leader line determines the distance of the fishing hook from the sinker.

4,137,665

CHILDREN'S MARIONETTE THEATRE

Martha Bierwiler, 120 E. Hazel St., Orlando, Fla. 32804

Continuation of Ser. No. 469,795, May 14, 1974, abandoned.
This application May 14, 1976, Ser. No. 686,486
The portion of the term of this patent subsequent to May 28, 1991, has been disclaimed.
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—13 **17 Claims**



1. A children's marionette theatre for self-propelled puppet-like objects comprising a housing defining a stage on which a multiplicity of different, interchangeable movable puppet-like objects are displayed in the manner of a puppet show, an upper ceiling member disposed over the stage having path-like guide means formed thereon, and and at least one general purpose self-propelled puppet transport vehicle supported on said ceiling member and guided by said guide means, said transport vehicle having hook means for easy use by children in securing selected ones of different, interchangeable puppet-like objects to said transport vehicle for display and movement across the stage whereby loading, movement and display of the puppet-like objects across the stage in the performance of a puppet show by children operating the marionette theatre, is facilitated.

4,137,666

TOY VEHICLE WITH OPTICAL WEAPONS SYSTEM

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1977, Ser. No. 774,960
Int. Cl.[2] A63H *17/00*
U.S. Cl. 46—202 **11 Claims**

1. A multifunction mobile toy assembly comprising;
a housing member;
a projectile firing system mounted on the housing member;
means attached to the housing member for providing locomotion;
optical means operatively associated with the housing mem-

ber for imaging an object including an imaging screen disposed for exterior viewing whereby the projectile

firing system can be aligned with target images for discharging projectiles at the target.

4,137,667

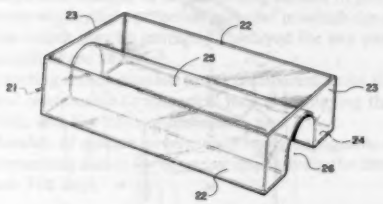
THERMAL PROTECTIVE COVERINGS

Volney Wallace, Terra, Box 1 West, and Carlos F. A. Pinkham, Terra, Box 4 East, both of Dugway, Utah 84022

Filed Dec. 23, 1977, Ser. No. 863,801

Int. Cl.[2] A01G *13/00*

U.S. Cl. 47—26 **10 Claims**



1. A self-supporting thermal protective cover for materials perishable by cold temperatures comprising a pan-shaped structure having outer walls, a floor and an upwardly extending indentation in said floor, said indentation being lower than the walls of the pan-shaped structure said pan being filled with a freezable liquid completely covering the indentation, said indentation enclosing the perishable material.

4,137,668

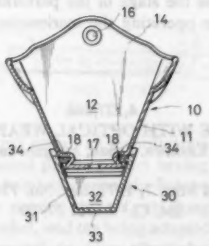
FLOWER-POT

Dairoku Kojo, 3-2-6-402, Chishirodai Minami, Chiba City, Chiba Prefecture, Japan

Filed Oct. 25, 1977, Ser. No. 844,865

Int. Cl.[2] A01G *9/02*

U.S. Cl. 47—66 **2 Claims**



1. A hanging flower-pot comprising in combination a body portion consisted of a forward curved wall, a rearward flat wall and a bottom wall, which walls are connected integrally with one another to form a receptacle having its top opening, said rearward flat wall having an extension protruding above the top edge of said receptacle and formed with an aperture for hanging said flower-pot on any vertical wall, said bottom wall having also an aperture formed therethrough, said body portion having a pair of opposed grooves which are formed on the external side faces of said forward wall adjacent to said bottom wall and extend substantially parallel to each other and substantially perpendicular to a plane including said rearward wall, each of said grooves having one end terminating at a position adjacent to the rearward wall of said body portion and the other end opened forward; and a bowl portion consisted of a forward curved wall having an internal curvature substantially corresponding to the external curvature in the forward wall of said body portion, a rearward flat wall and a bottom wall, which walls are connected integrally with one another to form a container having its top opening, the forward wall of said bowl portion having its internal side faces formed with a pair of opposed protrusions at positions corresponding to that of said grooves of said body portion, said protrusions extending substantially parallel to each other adjacent to the upper edge of said bowl portion, the height of said rearward wall in said bowl portion being such that the upper edge thereof terminates slightly below the bottom wall of said body portion when said bowl portion is mounted on said body portion, whereby said bowl portion can be mounted on said body portion from a forward direction thereto without any rotation.

4,137,669

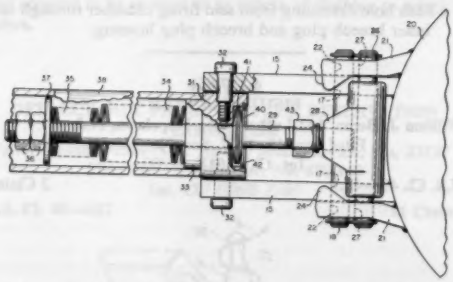
BALANCING MECHANISM FOR MANHOLE COVERS

Erwin J. Nunlist, Penfield, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Feb. 8, 1978, Ser. No. 876,082

Int. Cl.[2] E05F *1/10*

U.S. Cl. 49—386 **7 Claims**



1. In a balancing aid for a pivotally mounted manhole cover, comprising a stack of conical disc springs and means to compress said stack of springs as said cover pivots from an open vertical position to a closed position, the improvement wherein said stack of springs comprises a first subset of springs having a first diameter and a second subset of springs having a different diameter, with said first subset having a steeper spring force characteristic curve than said second subset, whereby the overall spring force characteristic curve of said combined stack of springs as said cover pivots from the open vertical position to the closed position is progressive.

4,137,670

HAND FILE BOARD WITH A CENTRAL HANDLE

Edwin A. Goralski, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

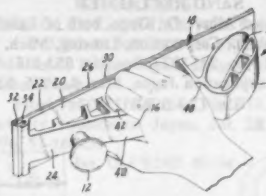
Filed Oct. 11, 1977, Ser. No. 840,615

Int. Cl.[2] B24D *15/04*

U.S. Cl. 51—392 **6 Claims**

1. In a hand file board of the type including a rigid portion having a firm elongate surface, and a firm resilient pad which overlays said firm surface and has an elongate generally planar surface against which a sheet of abrasive material may be secured, said rigid portion including front and rear handles

upstanding from its side opposite said firm elongate surface, with each of said handles adjacent a different one of its ends, the improvement wherein said rigid portion includes a fixed central handle between said front and rear handles, said central handle being elongate, being disposed generally parallel with



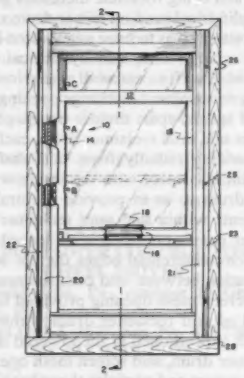
and aligned longitudinally of said planar surface, and being shaped for firm comfortable grasping by the thumb and fingers of a user's hand, said rigid portion having a through opening between said central handle and said planar surface for receiving the fingers of the user grasping the central handle.

4,137,671

STORM WINDOW LATCH MECHANISM

William C. Miller, 8934 Wilton Ave., Ellicott City, Md. 21043

Filed Feb. 11, 1977, Ser. No. 767,908
Int. Cl.[2] E05D *13/00*
U.S. Cl. 49—417 1 Claim



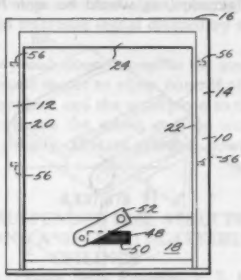
1. A window retaining and releasing means for retaining and releasing a window sash from a window frame wherein the window sash is provided with a resilient leaf spring type urging means for urging the sash to one side of the window frame for retaining the sash therein, a latch lever being attached centrally of the resilient urging means having means positioned on said latch lever for holding the resilient urging means in a collapsed position, the improvement comprising, said latch lever having an off-set (64) adjacent its outer end and the outer end of the offset extending downwardly substantially parallel with the plane of the inner portion of the latch lever, said latch lever having at least two slots extending inwardly of the lever perpendicular to the longitudinal axis of the said latch lever, the inner slot positioned to engage a latch lever receiving element for retaining the resilient member in extended position, the second slot positioned outwardly from the first slot and positioned to fix the resilient means adjacent the sash frame for removing the said sash from the window frame.

4,137,672

WINDOW CONSTRUCTION

Andrew J. Kircher, 4009 Oglethorpe St., Hyattsville, Md. 20782

Filed Dec. 19, 1977, Ser. No. 862,111
Int. Cl.[2] E06B *3/32*
U.S. Cl. 49—464 6 Claims



1. A window construction, comprising:

a window frame having vertical side members, a horizontal top member extending between the side members, a horizontal bottom member extending between the side members and stop members projecting from outer portions of each of said side members, said stop members located between said side members;

said top member defining a lower surface, said surface slanting downwardly and outwardly with respect to said frame at a predetermined angle;

said bottom member defining a top surface, said top surface slanting downwardly and outwardly with respect to said frame at said predetermined angle;

at least one window unit positioned within said frame, said unit including a sash having vertical side elements contacting said stop members when said window unit is in position within said window frame, a horizontal upper element extending between said side elements, a horizontal lower element extending between said side elements, and a glass pane or screen fitted within said sash;

said upper element defining an upper surface slanting downwardly and outwardly with respect to said frame at said predetermined angle;

said lower element defining a lower surface slanting downwardly and outwardly with respect to said frame at said predetermined angle;

said slanting surface of said sash upper element contacting said slanting surface of said frame top member in substantially complete contacting relationship and said slanting surface of said sash lower element contacting said slanting surface of said frame bottom member in substantially complete contacting relationship; and

fastening means located adjacent upper ends of said side elements and in operative relationship with each said window unit and with said frame for cooperating with said stop members, said frame and adjacent ones of said window units to hold said window unit in position within said frame.

4,137,673

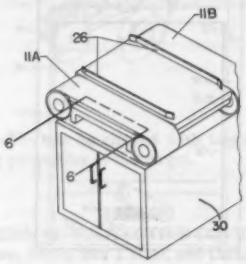
SKI DRESSING APPARATUS

Barry La Tour, Drawer 2139, Olympic Valley, Calif. 95730

Filed Apr. 23, 1976, Ser. No. 679,680
Int. Cl.[2] B24B *21/06*
U.S. Cl. 51—139 1 Claim

1. An apparatus for abrasively finishing or dressing ski surfaces, a sanding device comprising: a frame; a motor attached to said frame; spaced pulleys supported by said frame and at least one pulley driven by said motor; an abrasive belt located about said pulleys and the abrasive portion facing outward; an elongated, flat backing element located immediately beneath

the working area of said belt, and located between the pulleys, means pivotally attaching each end of the backing element directly to said frame, the backing element having sufficient resistance against flexing when subject to workloads but resilient enough to flex when subject to a mechanical means to flex; means to flex a center portion of the backing element in a convex configuration, as would be seen from a side view,



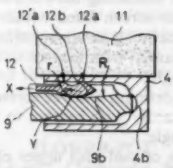
comprising a device which is affixed to said frame and makes cooperative contact with the center portion of the backing element, said device being telecopically adjustable toward and away from said backing element; and, guide means located at the working area for guiding the edge of the ski against the abrasive belt to provide for accurately refinishing the edge of the ski.

4,137,674

METHOD OF CONCENTRIC GRINDING

Shuhei Noro, Aichi; Kunio Hayashi, Nagoya, and Yoshisada Wada, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 4, 1977, Ser. No. 774,421
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—281 R **2 Claims**



1. Method of corrective cutting of a rough cylindrical blank for a valve-lifter of an internal combustion engine comprising the following steps:

forming a rough cylindrical blank having a concave spherical seat on the inner surface of its bottom by casting or forging and coining with a steel ball;

applying a holder comprising a rotatable shaft with its outer diameter smaller than the inner diameter of said blank, said shaft having a tip, and three circumferential substantially equidistant longitudinal grooves, with the bottom of each groove having a cylindrical surface with radius R about an axis at right angles to the longitudinal direction of said shaft, and an expansion pawl having at its top a projection which contacts the inside surface of said blank and having at its bottom a cylindrical surface with radius r ($R > r$) or an equivalent convex curved surface and is slidable along said groove, so that the tip of the rotatable shaft contacts said concave spherical seat of said blank;

pulling said expansion pawl through a spring connected to the expansion pawl axially of the rotatable shaft, whereby the blank is fixed coaxially to the rotatable shaft as the result of the projection of said expansion pawl against the inside surface of the blank;

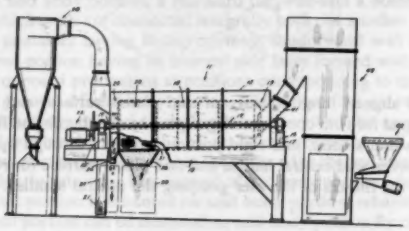
and then cutting said blank to make its outside surface concentric with said concave spherical seat of said blank.

4,137,675

SAND RECLAIMER

Ronald A. Cina, and Albert D. Kluge, both of Lansing, Mich., assignors to Roberts Corporation, Lansing, Mich.

Filed Nov. 21, 1977, Ser. No. 853,415
Claims priority application Japan, Mar. 9, 1976, 51-025362
Int. Cl.[2] B24B *31/02*
U.S. Cl. 51—164 R **5 Claims**



1. A cylindrical sand reclaimer assembly for removing spent bonding contaminants and refuse from chemically bonded foundry molding sand and the like comprising:

a support frame, said support frame provided with an elongate housing thereon;

an elongate main shaft rotatably provided in an inclined position through said housing;

a cylindrical sand reclaimer drum fixedly mounted on said main shaft and being rotatable therewith within said housing, said cylindrical sand reclaimer drum maintained in an inclined position so as to have an elevated loading end and lowered discharge end, said cylindrical sand reclaimer drum provided with an end wall at said lowered discharge end having contaminant discharge openings therethrough;

a plurality of spaced-apart divider panels provided on said shaft within said sand reclaimer drum, each of said divider panels extending radially from said shaft into abutting circumferential contact with the inside wall of said sand reclaimer drum so as to provide a plurality of separate compartments within said sand reclaimer drum, each of said divider panels provided with spaced-apart openings along the circumferential edges thereof so as to provide communication between said compartments;

at least one screen mesh opening provided in the circumferential wall of said reclaimer drum within said compartment which is positioned at the lowered discharge end of said reclaimer drum, said screen mesh opening adapted to selectively screen and particles therethrough while retaining oversize contaminants and refuse thereon;

a cleaned sand discharge chute provided beneath said screen opening so as to receive cleaned sand which has passed therethrough;

a spent bonding contaminant and refuse discharge chute provided beneath said discharge end of said cylindrical sand reclaimer drum so as to receive spent bonding cotaminants and refuse therefrom;

drive means provided in association with said main shaft, said drive means adapted to rotate said main shaft and said cylindrical sand reclaimer drum at a rate sufficient to advance a sand mass along the interior of said sand reclaimer drum through each of said compartments by passing through said openings in said divider panels so that cleaned sand particles drop through said screen mesh opening and oversize spent bonding contaminants and refuse are expelled through said contaminant discharge openings in said end wall; and

cyclone air removal suction means provided in association with said housing proximate to said lowered discharge

end of said sand reclaimer drum, said cyclone air removal suction means adapted to remove freed resin particles from the sand mass passing through said sand reclaimer drum.

4,137,676

CONTROLLING DEVICE FOR GRINDING PIEZO-ELECTRIC ELEMENT

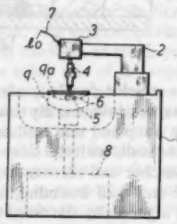
Nakanobu Moritani, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Japan

Filed Jul. 22, 1977, Ser. No. 818,325

Claims priority, application Japan, Jul. 23, 1976, 51-87869; Dec. 29, 1976, 51-160453

Int. Cl.[2] B24B *49/04*

U.S. Cl. 51—165 R **14 Claims**



1. A controlling device for grinding piezo-electric element comprising:

detecting means for detecting an electric signal produced at the time of grinding a piezo-electric element;

local oscillating means;

a frequency convertor for generating a frequency of the difference between the output frequency of the local oscillating means and the frequency of the electric signal;

filter means for making selection of frequencies generated from the frequency convertor when a desired grinding condition of a piezo-electric element has been reached; and

controlling means for stopping grinding of the piezo-electric element in response of the output of the filter means.

4,137,677

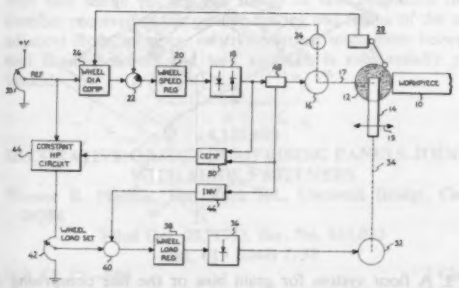
CONSTANT HORSEPOWER CONTROL FOR GRINDING WHEEL DRIVES

Robert J. Nedreski, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Oct. 3, 1977, Ser. No. 838,739

Int. Cl.[2] B24B *49/16*

U.S. Cl. 51—165.77 **9 Claims**



1. In a drive system for a grinding wheel of the type including a first motor and associated control for rotating the wheel at a constant surface speed and a second motor and associated control for providing linear motion between the wheel and the workpiece; an improved control for maintaining constant grinding power, comprising:

(a) means to provide a first signal proportional to the counter electromotive force of the first motor;

(b) means to provide a reference signal proportional to a desired surface speed of the grinding wheel;

(c) means to develop a second signal proportional to the quotient of said reference signal divided by said first signal; and,

(d) means to apply said second signal to the associated control for the second motor to effect control of the relative position of the wheel and the workpiece to thereby vary the pressure between the wheel and the workpiece and maintain substantially constant grinding power.

4,137,678

VERTICALLY SUSPENDED FOIL STRUCTURE FOR SOUND MUFFLING AND LIGHT SCATTERING FALSE CEILINGS

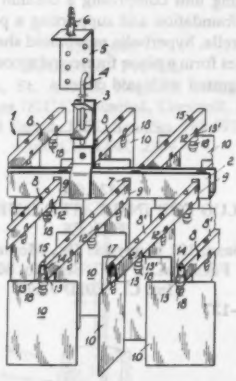
Giovanni Varlonga, Piazza della Repubblica, 7, Milan, Italy

Filed Jun. 17, 1977, Ser. No. 807,476

Claims priority, application Italy, Jun. 25, 1976, 24755 A/76

Int. Cl.[2] G09F *7/18*

U.S. Cl. 52—39 **1 Claim**



1. A vertically suspended foil or blade structure for sound muffling and light scattering false ceilings, comprising a grid of crossbeams resting on longitudinal stringers and foils or blades attached on the crossbeams at an angle to one another by means of a crossbeam engaging device, wherein said crossbeam engaging device has a spring biased head adapted for insertion and retention in a hole through a wall of the crossbeam and a faceted body whereto a foil or blade is affixed rigidly, said faceted body having plane surfaces at an angle to each other and forming at least two opposite corners thereon, and wherein each crossbeam is a channel sectional member made of sheet metal, said channel section having a pair of spaced apart parallel wing portions forming a gap therebetween and a web portion connecting bridge-like said wing portions, said wing portions having their free longitudinal edges facing downwardly thereby said gap having its longitudinal opening facing downwardly, said web portion having holes provided at regular intervals therethrough and said wing portions having notches in alignment with said holes adapted to engage said head in the hole and concurrently snap engage said two opposite corners of said device in said notches in the wing portions of the crossbeam channel sectional member, and wherein in said crossbeam engaging device the insertable head is split lengthwise to provide spring bias thereof and wherein said crossbeam engaging device has a circumferential groove between the head and the faceted body thereof, to allow for retention and rotation thereof when engaged in said hole and wherein pairs of said opposite corners of the faceted body for

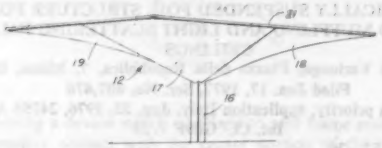
snap engagement with the crossbeam notches are arranged in planes forming mutual angles which are equal to the mutual angles formed by said foils or blades.

4,137,679

INVERTED, DOUBLY-CURVED UMBRELLA, HYPERBOLIC PARABOLOID SHELLS WITH STRUCTURALLY INTEGRATED UPPER DIAPHRAGM

Daniel F. Tully, 110 Ellis Farm La., Melrose, Mass. 02176

Filed Jul. 5, 1977, Ser. No. 812,513
Int. Cl.² E04B *1/34, 7/10*
U.S. Cl. 52—73 **4 Claims**



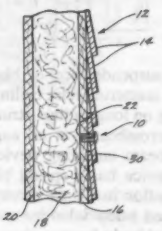
1. A building unit comprising a column adapted to be anchored to a foundation and supporting a plurality of doubly-curved, umbrella, hyperbolic paraboloid shells inverted so that their top edges form a plane figure and a continuous horizontal member integrated with said edges.

4,137,680

HOLE PLUG FOR INSULATED INJECTION WALL HOLES

R. Dean Doonan, 101 Sunnyside Dr., Montezuma, Iowa 50171

Filed Jun. 8, 1977, Ser. No. 804,545
Int. Cl.² E02D *35/00*
U.S. Cl. 52—127 **8 Claims**



1. A hole plug for insulation injection holes in building walls comprising,

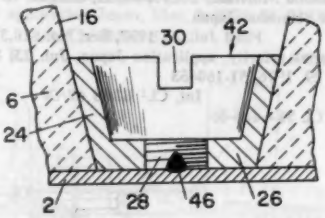
a circular disc shaped head having a plurality of peripherally disposed transverse arcuate legs, radially inwardly offset from the outer edge of said head thereby forming a flange having a flat bottom surface and said head having a slightly convex outer surface to blend into a wall surface, said legs having adjacent straight longitudinal edges in spaced relation and including exterior surfaces having a series of annular shoulders tapered longitudinally away from said head thereby forming gripping teeth, said flange and the flat surface of said annular shoulder adjacent said flange forming an annular space therebetween and said flat bottom surface of said flange being parallel to said flat surface of said adjacent annular shoulder and the bottom surface of said annular space being perpendicular to said flat bottom surface of said flange and said flat surface of said adjacent annular shoulder.

4,137,681

FASTENING DEVICE FOR SECURING WEAR-RESISTANT TILES TO A BACKING

Edward L. Pasley, Mexico, Mo., assignor to A. P. Green Refractories Co., Mexico, Mo.

Filed Oct. 6, 1977, Ser. No. 839,802
Int. Cl.² E04B *1/40*; E02D *35/00*
U.S. Cl. 52—127 **13 Claims**



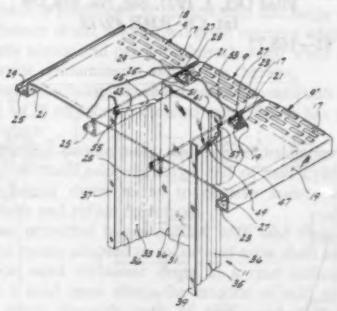
1. An anchor for attaching a tile to a metal backing, the tile having a hole that tapers downwardly toward the backing, said anchor comprising: a tapered side wall and an end wall at the small end of the side wall, with the side wall being concentric to the axis of the anchor and surrounding a socket in the anchor and with the end wall extending across the end of the socket and having a generally flat front face that is generally perpendicular to the axis of the anchor, the side wall being narrow enough to fit into the large end of the tapered hole and to seat in the hole with the flat front face of the end wall close to the metal backing, the end wall having an aperture extended completely through it so that a welding rod can be passed through the socket and aperture and brought against the metal backing, the end wall further having a groove that extends partially into it and radiates from the aperture, the groove opening forwardly out of the flat front face of the end wall and toward the metal backing but not rearwardly toward the large end of the sidewall, whereby molten metal from the welding rod will flow outwardly away from the aperture.

4,137,682

FLOOR SYSTEM FOR GRAIN BIN

Mark A. Trumper, Sullivan, Ill., assignor to Grain Systems, Inc., Assumption, Ill.

Filed Nov. 29, 1977, Ser. No. 855,610
Int. Cl.² E04B *1/70*
U.S. Cl. 52—303 **7 Claims**



1. A floor system for grain bins or the like comprising a plurality of channel-shaped floor members adapted to be interlocked in side-by-side abutting relation to form a substantially continuous floor surface and a plurality of vertical supports adapted to be secured to the underside of said floor members and to support the floor members above a foundation or the

like, each of said floor members being a one-piece member formed of sheet metal or the like and having a substantially flat web constituting the horizontal surface of said floor system and a downwardly extending flange at each side of the web, one of said flanges constituting an inside floor flange having an inside leg extending inwardly from the outer end of said inside floor flange beneath said floor web, said inside leg being substantially parallel to said floor web, and a lip extending upwardly toward said floor web from the inner end of said inside floor leg, the other of said floor flanges constituting an outside floor flange having an outside floor leg extending outwardly from the lower end thereof beyond the outside floor flange and an outside floor lip extending upwardly from the outer edge of said outside floor leg whereby the inside flange, leg and lip of one floor member are adapted to be received within the outside flange, leg and lip of a next adjacent floor member so that adjacent floor members are substantially interlocked in side-by-side abutting relation; each of said supports comprising a one-piece member of sheet metal or the like and being channel shaped in cross-section, said support having a support web, a first support flange at one side of the support web, a second support flange at the other side of the support web, said first and second support flanges each having a respective support lip at the outer ends thereof extending outwardly, and means at the upper end of the support for positively engaging and securing said support to said floor members, this last-said means comprising a first bearing surface on the upper end of said first support flange adapted to support the outside floor leg of a floor member immediately above said support web, this last-said floor member being referred to as an immediate floor member, a second bearing surface on said second support flange adapted to support the outside leg of a next adjacent floor member, said support web extending up above the level of said first and second bearing surfaces and having a first side generally contiguous to the inner face of the outside flange of said immediate floor member and a second side generally contiguous to the inner face of the inside flange of said immediate floor member, said first support lip extending above said first bearimg surface and being disposed on the outside of the lip of said outside flange of said immediate floor member, said second support lip extending above said second bearing surface and being disposed on the inner face of the outside flange of its respective next adjacent floor member whereby said first and second support lips and said first and second sides of said support web substantially prevent lateral movement of said support leg relative to said floor members, said first support lip having a first notch therein for receiving the outside floor lip of said immediate floor member, and said second side of said support web having a second notch therein for receiving said outside floor lip of its respective next adjacent floor member with the inside floor lip of said immediate floor member being snugly received in said outside floor lip of said next adjacent floor member whereby with said respective floor lips being received in their respective notches, and with said support bearing surfaces bearing against their respective floor legs and with said inside lip, leg and flange of said immediate floor member received in the outside lip, leg and flange of the next adjacent floor member, relative vertical movement between said floor members and said supports is substantially prevented.

4,137,683

DECORATIVE OBJECT COMPRISING PANELS JOINED WITH SLIDE FASTENERS

Werner B. Pfeiffer, Flat Rock Rd., Cornwall Bridge, Conn. 06754

Filed Oct. 20, 1977, Ser. No. 844,033
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—506 **1 Claim**

1. In combination, a decorative object comprising a plurality of panels, each panel being a thin single ply sheet of woven fabric and having two opposite connecting margins, the said two connecting margins of one panel being parallel to each other and adjacent respectively to individual connecting margins of two other panels, the margins comprising each pair of adjacent connecting margins having secured thereto the respective stringers of a separable slide fastener chain, said separable slide fastener stringers each comprising a row of spaced teeth, the rows being uncovered and readily apparent to the observer of said object and being inter-engaged and serving as the sole connecting means to integrate the panels into an assembly, the assembled panels having surface ornamentation thereon; and flat vertical supporting means underlying said object and securing elements supporting said object against said supporting means, said object being secured to said support means with at least one line of fasteners spaced from said support means and at least one adjacent line of fasteners engaging said support means to give a three-dimensional aspect to said object.

4,137,684

BUILDING PANEL

John H. Shennan, St. Austell, England, assignor to Selleck Nicholls Williams (E.C.C.) Limited, Cornwall, England

Filed Feb. 4, 1977, Ser. No. 765,692
Int. Cl.[2] E04C *2/04*
U.S. Cl. 52—602 **4 Claims**

1. A building element for use in constructing a building, said element comprising a rectangular panel of a height, when upright, substantially equal to one story of the building such that a plurality of such panels laterally adjacent each other can form a story of the building, said panel having an inner face, an outer face, a top edge, a bottom edge and two side edges, wherein the inner face has four flanges each of which projects from said inner face adjacent to a respective one of said top, bottom and two side edges, each of said flanges extending the whole or substantially the whole length of the edge to which it is adjacent, wherein the bottom edge and the two side edges each have at least one groove running the length thereof, and wherein the flanges adjacent said top, bottom and two side edges are provided with means suitable for, or suitable for use in, the fixing of the building element to another similar or different building element, and wherein the outer face of the panel has an outwardly flared portion adjacent the bottom edge of the panel.

4,137,685

SULFUR-COATED BAMBOO REINFORCEMENT MEMBER FOR CONCRETE ARTICLES

Hsai-Yang Fang, 1847 Markham Dr., Bethlehem, Pa. 18017, and Harshavardhan C. Mehta, 37-A Southern Ave., Calcutta, 700029, India

Filed Apr. 5, 1977, Ser. No. 784,686
Int. Cl.[2] E04C *3/36*
U.S. Cl. 52—727 5 Claims

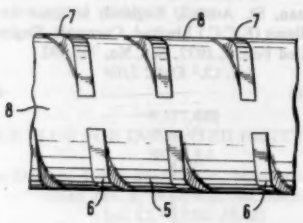
1. A reinforcement member for concrete bodies comprising:
(a) a bamboo rod having a roughened surface said roughened surface being a bamboo cortex without a waxy cuticle of epidermis; and
(b) a substantially continuous coating of crystallized sulfur contacting and adhering to said cortex of said bamboo rod, to prevent moisture absorption and swelling of said bamboo rod.

4,137,686

STEEL RODS WITH HOT ROLLED RIBS FORMED IN A PARTIAL SPIRAL

Georg Kern, Munich, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 23, 1978, Ser. No. 871,332
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704819
Int. Cl.[2] E04C *3/30, 5/03*
U.S. Cl. 52—734 4 Claims



1. Steel rods for reinforcing rods, tensioning rods and the like, of the type which comprise a core substantially circular in cross-section and contain ribs formed by the hot rolling process, which are symmetrically arranged with respect to the longitudinal axis of the rod and which extend along a spiral line so as to form part of a screw thread, which comprise at least three to six series of said ribs spaced from each other and distributed over the circumference of the core of the rod, said rods being of such construction and number per unit length that any cross cut through the rod must pass through at least one rib.

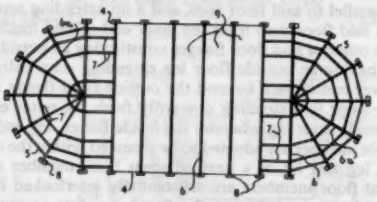
4,137,687

STRESSED MEMBRANE SPACE ENCLOSURE

Philip D. Sprung, 1001 - 10th Ave., SW., Calgary, Alberta, Canada

Filed Jun. 28, 1977, Ser. No. 810,900
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—747 8 Claims

1. The method of building a space enclosing membrane covered structure comprising the steps of:
(a) erecting a plurality of transversely disposed longitudinally spaced arch-like frame members wit each arch foot mounted on an individual pad freel shiftable in any direction on the ground;
(b) securing by its opposite edges an elongate strip of fabric in a loose condition between each pair of adjacent transversely disposed frame members;
(c) horizontally spreading successively at spaced apart levels and in a direction longitudinally of the structure by a removable load regulated power jack each fabric-connected pair of arch-like frame members until the intermediate fabric strip throughout its length reaches a predetermined uniform tension with the arch foot pads each free to shift in any direction on the ground in response to such spreading action, and



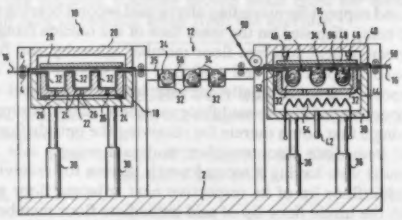
(d) securing each said pair of frame members in such spread, predetermined uniform fabric tensioning spaced condition.

4,137,688

METHOD OF VACUUM PACKING OBJECTS IN PLASTIC FOIL

Kastulus Utz, Neubeuern; Josef Esterhammer, and Heinz Hikl, both of Rosenheim, all of Germany, assignors to Alkor-Werk Karl Lissmann GmbH & Co KG, Munich, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,385
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1976, 2641160
Int. Cl.[2] B65B *31/02*
U.S. Cl. 53—432 8 Claims



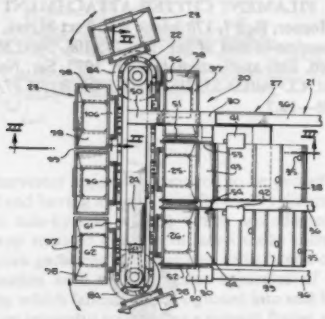
1. A method of packing objects which comprises:
(a) inserting respective ones of said objects in receptacles formed in a unitary body of sheet material,
(1) said receptacles having orifices open in a common direction,
(2) said body having an annular edge portion enveloping said orifices and at least one rib portion separating each orifice from each other orifice;
(b) holding said body having said objects inserted therein in a closed chamber while a first gas pressure lower than atmospheric pressure is maintained in said chamber;
(c) superimposing a cover member of sheet material on said edge portion and said orifices in said chamber;
(d) sealing said cover member to said edge portion in gastight engagement;
(e) exposing said body and the cover member sealed to said edge portion to a second gas pressure sufficiently higher than said first pressure to cause said cover member to be pressed against said at least one rib portion; and
(f) thereafter sealing said cover member in gastight engagement to said at least one rib portion.

4,137,689

BAG FILLING AND WEIGHING MACHINE

Stanley A. McClusky, 5900 Kirkside Ave., Apt. A, Bakersfield, Calif. 93309, and Jerry L. Boyd, Bakersfield, Calif., assignors to Stanley A. McClusky, Bakersfield, Calif.

Filed Oct. 7, 1977, Ser. No. 840,324
Int. Cl.[2] B65B *1/32, 43/26*
U.S. Cl. 53—502 15 Claims



10. In a bag filling and weighing machine including independently actuatable main article feed means associated with a first weighing station means, and independently actuatable dribble article feed means associated with a second weighing station means, and means for movement of bags from said weighing station only after each bag is filled to a predetermined weight, bag conveying means for transporting bags to and from the weighing stations, bag holder means operatively engaging a bag conveying means for transportation thereby, and cooperable support means on said bag holder means and on a conveyor frame structure, the improvement comprising:

means for vertically yieldably connecting one side of each holder means to said conveying means;

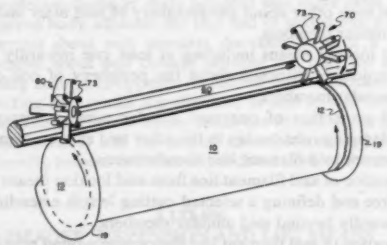
said cooperable support means having movement corresponding to movement of said conveyor means for supporting said one side of said holder means during change in direction of said conveying means.

4,137,690

APPARATUS FOR WRAPPING PAPER ROLLS

James A. Morgan, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Sep. 14, 1977, Ser. No. 833,299
Int. Cl.[2] B65B *11/04*
U.S. Cl. 53—176 5 Claims



1. Apparatus for protectively wrapping a cylindrical reel of paper with header sheets of greater surface area than respective end-faces of said reel, said header sheets area exceeding said end-face area by an excess area which is folded upon the cylindrical surface of said reel and overlaid with a circumferentially wrapped sheet, said apparatus comprising first means to axially rotate said reel in a laterally stationary position and second means to secure said header sheets in position against said reel end-faces simultaneous with said reel rotation, the improvement comprising:

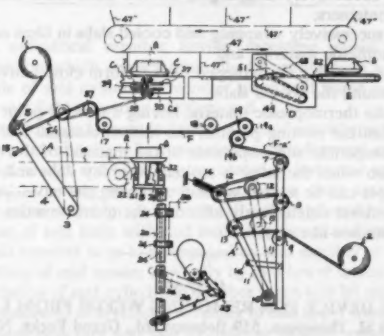
pleating wheel means to fold said excess header area over the edge junction between said reel end-faces and said cylindrical surface, said excess area being sequentially pleated and creased against said cylindrical surface as said reel revolves about said reel axis, said pleating wheel means comprising a plurality of finger elements projecting radially from respective second axes of rotation, said second axes of rotation being skewed to the respective planes of corresponding reel end-faces whereby rotational planes traversed by said finger elements converge to intersection with said end-face planes and said excess area portion thereof at acute angles.

4,137,691

PACKAGING MACHINE

Shizuo Takahashi, Abiko, Japan, assignor to Tokyo Automatic Machinery Works, Ltd., Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,981
Claims priority, application Japan, Mar. 2, 1976, 51-23008; Mar. 2, 1976, 51-3706; Mar. 2, 1976, 51-3707
Int. Cl.[2] B65B *11/16, 11/22*
U.S. Cl. 53—229 18 Claims



1. A packaging machine comprising tension means for delivering stretchable strip films under proper tension, an elevator means having supporting upright arms for pushing up an article to be wrapped from the bottom into engagement with film positioned horizontally by means of said tension means to wrap the upper surface of the article and form two downwardly extending film portions at opposite ends of the article, a heat sealing and cutting means for folding said two downwardly extending film portions toward one another below said article to form a sleeve and for heat-sealing said film portions to one another and cutting them from the remainder of the film supplied by said tension means by means of radiation heat from a heater, a pinching means for pinching and pulling the both open sides of said sleeve to fold them down to the bottom of said article, and a heat sealing means for heat-sealing the so folded sides of said sleeves.

4,137,692

SYSTEM FOR METERING AND FILM PACKAGING OF BITUMEN AND LIKE MATERIALS

Giorgio Levy, Viale Coni Zugna, 43, Milan, Italy

Continuation-in-part of Ser. No. 419,818, Feb. 12, 1974, abandoned. This application Apr. 1, 1977, Ser. No. 783,819
Int. Cl.[2] B65B *63/08, 53/06*
U.S. Cl. 53—440 8 Claims

1. A method of making and packaging slabs of bitumen and the like thermoplastic materials, comprising:

(A) providing a plurality of containers each constituting

plural parts which are engageable and disengageable transversely with one another so that each container can be closed with an open mouth, closed sides and a closed bottom or open with an open mouth, open sides and an open bottom;

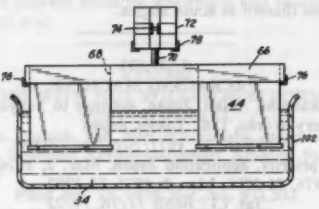
(B) manipulating successive open containers to close the same;

(C) heating the thermoplastic material to a molten state;

(D) successively filling the closed containers through their open mouths with metered amounts of molten material;

(E) cooling the filled closed containers to solidify the molten material in the containers into slabs;

(F) manipulating successive closed containers to open the side walls and bottoms thereof;



(G) successively discharging cooled slabs from the open containers;

(H) successively wrapping said cooled slabs in films of thermoplastic material; and

(I) heat sealing the wrapped films to form closed envelopes around the cooled slabs;

(J) the thermoplastic material having a melting point lower than the melting point of the molten material and being compatible and dispersible in the material of the cooled slab when the latter is molten, whereby slabs and envelopes can be melted without removing the envelopes and without deleteriously affecting the characteristics of the bitumen-like material.

4,137,693

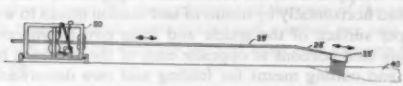
RAKE DEVICE FOR REMOVING WEEDS FROM LAKES

Lowell H. Thompson, 519 Belmont Rd., Grand Forks, N. Dak. 58201, and Arne Goplen, Binford, N. Dak. 58416

Filed May 12, 1977, Ser. No. 796,428

Int. Cl.[2] A01D *44/00*

U.S. Cl. 56—8 **2 Claims**



1. A device for raking the bottom of lakes comprising a portable frame adapted to be mounted on a beach adjacent a lake, said portable frame having a reversible motor and a pair of wheels at least one of which is driven by said motor, a rake having an elongated flexible rod means acting as a handle, said device being positioned with the front end of said rod means pointed toward said lake, with said rake mounted at the front end of said rod means, said rod means having a portion engagably mounted between said wheels to be driven by said at least one drive wheel to move the rod means endwise longitudinally along its length forward and backward powered by the motor to thereby move the rake forward and backward into and out of the lake, rod support guide means mounted on said device at a location along the length of the rod means and spaced from the drive wheels having portions receiving and engaging lateral sides of the rod means to guide said rod means longitudinally along its length when driven by said drive wheel, said rake having upright teeth said teeth having means whereby said teeth may move rearwardly and inwardly when said rake is moved forward into the lake along the floor bottom powered by said motor, said rake having stop means acting to retain said teeth substantially upright when said rake is powered rearward out of the lake.

4,137,694

FILAMENT CUTTER ATTACHMENT

Gene A. Hopper, R. #7, 178 Island Rd., Fort Myers, Fla. 33905

Continuation-in-part of Ser. No. 745,105, Nov. 26, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,555

Int. Cl.[2] A01D *55/18;* A01G *3/06;* B27B *27/00*

U.S. Cl. 56—12.7 **22 Claims**

1. An attachment for cutting and trimming vegetation for use with a powered edger having a drive spindle and a removable metal cutter blade driven by said drive spindle, said attachment being adapted for fixed engagement on said drive spindle after said metal cutter blade has been removed, said attachment comprising;

inner and outer annular members having axially aligned through holes for fitted securement over the end portion of said drive spindle,

compression means for securing said inner and outer annular members in compressed relationship relative to each other,

at least one length of filament line having a portion centrally attached between said inner and outer annular member and having at least one free end opposite said attached portion,

a plurality of locking means for detachably securing said filament line at a point intermediate to said attached portion and said free end,

said locking means disposed in spaced relationship relative to each other about the periphery of said inner and outer annular members,

said locking means including at least one inwardly facing projection disposed about the periphery of one of said annular members,

said projection of one said annular member disposed in clamping relationship to the other said annular member to secure said filament line therebetween,

a portion of said filament line from said locking means to said free end defining a selected cutting length extending outwardly beyond said annular members,

a portion of said filament line disposed in wound relationship to said drive spindle,

whereby said filament line may be adjusted to be secured by any one of said plurality of locking means and therefore varying the position of the same along the periphery of said attachment and whereby adjustment of said filament line between said locking means winds and unwinds the same so as to allow for the selection of a specific cutting length.

4,137,695
CORN HARVESTERS

Ernest F. Sammann, Rte. 4, Box 73, Dimmitt, Tex. 79027

Filed May 16, 1977, Ser. No. 796,882
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—119 14 Claims

1. In a harvester apparatus arranged to be propelled along the ground and having a plurality of forwardly directed snouts arranged in side-by-side relation which are adapted to pass between crop rows to guide corn laden stalks therebetween and into a corn gathering snapping row and a lateral conveyor, the combination with said harvester apparatus of a pickup apparatus by which fallen stalks are guided into said harvester;

said pickup apparatus comprising a support frame, a laterally arranged drive shaft mounted on said support frame in superimposed relationship above said lateral conveyor, drive means for axially rotating said shaft, a cantilever arm superimposed over the central location of said snouts and having a free end disposed in close proximity of the forward end of said snout and a pivoted end supported in journaled relation on said shaft;

said pivoted end includes a yoke journaled to said shaft and supportedly affixed to said journaled end of said cantilever arm such that said yoke can be pivoted about said shaft to pivotally move said free end of said cantilever arm about said shaft;

a drive sprocket affixed to said shaft, an idler sprocket affixed to said free end of said arm, an endless conveyor disposed about each of said sprockets, said conveyor including lugs attached thereto by which a corn stalk is moved toward said lateral conveyor; and, means affixing the free end of said yoke to said harvester apparatus;

an auger associated with the outermost of saids snouts, said auger having a spiral screw formed thereon; said auger having a forward end journaled to the free end of said snout and a driven end journaled to said support frame;

drive means by which said shaft axially rotates said auger, said auger on one side of said harvester rotating in an opposed direction respective to the auger located on the other side;

said auger having a cylindrical configuration which includes a constant diameter body adjacent said drive shaft and a conical body adjacent the free end of said snout; a spiral located about said constant diameter portion; a spiral located about said conical portion; the last two spirals being arrange in opposed directions; a plate member connecting said spirals together and affixed to said constant diameter portion whereby stalks are forced towards said plate member and the ears of corn thereon are knocked laterally toward the centrally located ones of the snouts.

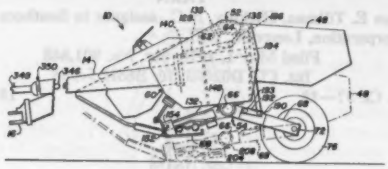
4,137,696
HEADER SUSPENSION AND LIFT MEANS

Bryant F. Webb, Ephrata, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Jan. 7, 1977, Ser. No. 757,724
Int. Cl.[2] A01D *67/00*
U.S. Cl. 56—208 5 Claims

1. In a crop harvesting machine having a crop harvesting header, a mobile frame adapted to move across a field in a forward direction, said mobile frame including upper frame structure extending transversely to said forward direction and a lower wheel frame assembly, said assembly including a cylindrical member extending transversely to said forward direction and rotatably mounted to and supporting said upper frame structure, and lift means on said frame and being actuatable for moving said lower wheel frame assembly, and thereby rotating said cylindrical member thereof, relative to said upper frame structure to effectuate raising of said upper transverse frame structure and said cylindrical member relative to the field between a lower field operating position and an upper transport position, an improved means for suspending said header from said mobile frame so as to dispose said header in a harvesting position adjacent the field when said frame is at its lower field operating position and for lifting said header upwardly relative to the field during effectuation of raising of said frame, comprising:

upper means pivotally interconnecting said upper frame structure with an upper portion of said header;



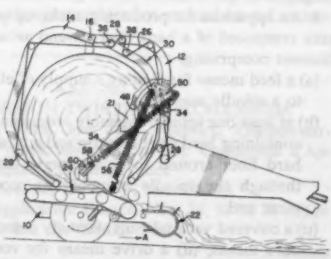
said cylindrical member having mounting means fixed thereon which project generally forwardly from a front side of said cylindrical member when said frame is at its lower field operating position; and

lower elongated means including a pair of spaced apart links respectively pivotally connected at their forward ends to said header and pivotally connected at their rear ends to said mounting means and including on their rear ends portions which project rearwardly of the pivotal connection of said links with said mounting means and underlie said member so as to be engaged by said member to effect lifting of said header upwardly by said lower means upon rotation of said cylindrical member when said lift means is actuated so as to effectuate raising of said upper transverse frame structure and said cylindrical member relative to the field.

4,137,697
BALE DENSITY STRUCTURE FOR CYLINDRICAL BALERS

William H. Knapp; Carmen S. Phillips, and Walter A. Anderson, all of Memphis, Tenn., assignors to International Harvester Company, Chicago, Ill.

Filed Mar. 18, 1977, Ser. No. 778,892
Int. Cl.[2] A01D *39/00*
U.S. Cl. 56—341 7 Claims



1. In a baler of the type having a plurality of driven belts effective in tension to compress a cylindrical bale being formed, an improved system for controlling the density of the bale comprising:

a belt tension unit movable on the baler to impose tension on the belts;

and means including two springs cooperating with said unit for initially exerting a force from only one of said springs and, upon the bale reaching a predetermined size, exerting a force from both of said springs to move the unit to compress the bale with a density less at its center than its surrounding portions.

4,137,698

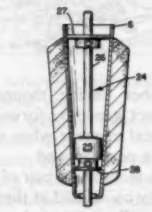
METHOD AND APPARATUS FOR WINDING COVERED YARN

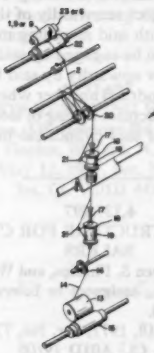
James E. Tillman, Hickory, N.C., assignor to Southern Elastic Corporation, Longview, N.C.

Filed May 1, 1978, Ser. No. 901,848

Int. Cl.[2] D02G *3/36*; B65H *54/08*

U.S. Cl. 57—18 **15 Claims**





1. An apparatus for producing a take-up package of covered yarn composed of a hard fiber wound around an elastomeric filament comprising:

(a) a feed means for feeding a supply of elastomeric filament to a spindle assembly;

(b) at least one spindle assembly containing a rotatable spool containing hard fiber thereon and a means for winding the hard fiber around the elastomeric filament as it passes through the spindle assembly to produce the covered yarn; and,

(c) a covered yarn take-up assembly composed of (i) hollow core means; (ii) a drive means for rotating said hollow core at a predetermined speed; (iii) a shaft assembly disposed in said core including a shaft, means for centering the shaft in said core, and a mass disposed on the shaft between its midpoint and one of its free ends for dynamically unbalancing the shaft assembly during rotation.

4,137,699

TEXTILE MACHINE WITH DEVICES FOR DETERMINATION OF THE TRANSVERSE DIMENSION OF RUNNING YARN

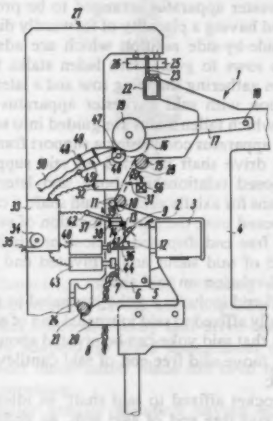
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7341 Bad Überkingen, Fed. Rep. of Germany, and Erich Loepfe, Pfaffhausen, Switzerland, assignors to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Mar. 21, 1978, Ser. No. 888,654

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714353

Int. Cl.[2] D01H *15/00, 13/16*

U.S. Cl. 57—264 **20 Claims**



1. Spinning machine apparatus comprising:

a plurality of spinning units, such as open-end spinning units, which each produce a running yarn,

yarn measuring means at each of said spinning units for determining the transverse dimension of the running yarn at the respective spinning units,

intermediate storage means at each of said spinning units for storing yarn measurement data obtained by said yarn measuring means,

electronic switching circuit means interconnecting said yarn measuring means and said intermediate storage means,

a mobile servicing instrument which is selectively movable to respective servicing positions adjacent the respective spinning units,

a process computer carried by said mobile servicing instrument,

connecting means for selectively connecting said process computer with respective ones of said intermediate storage means so that said process computer can process the yarn measurement data stored in said intermediate storage means,

and at least one function element including means for executing a servicing operation at respective ones of said spinning units, said at least one function element being controlled by the process computer as a function of the yarn measurement data supplied thereto by said connecting means.

4,137,700

BROKEN YARN TRANSFER MECHANISMS FOR TEXTILE YARN PROCESSING MACHINES

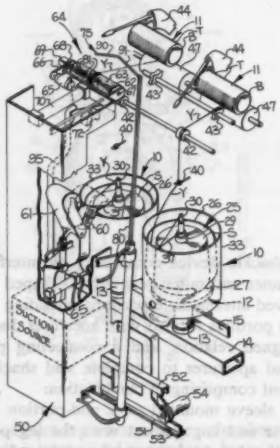
Gert Münker, Krefeld, Germany, assignor to Palitex Project Company GmbH, Fed. Rep. of Germany

Filed May 31, 1978, Ser. No. 911,272

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726229

Int. Cl.[2] D01H *15/00*; B65H *54/22*

U.S. Cl. 57—261 9 Claims



1. In a textile yarn processing machine, such as a two-for-one twister or the like, the combination of:

a plurality of yarn processing stations mounted in generally side-by-side relationship along the outside of said machine and each including a spindle assembly carrying a hollow supply package of yarn to be processed, and a take-up assembly for taking up the yarn after processing and including a cradle mechanism carrying a take-up package of yarn and means for selectively rotating the take-up package for winding of processed yarn thereon during yarn processing and for being disengaged to stop rotation of the take-up package for doffing or in the event of yarn breakage;

yarn knotter means for being selectively positioned in front of said yarn processing stations in the event of yarn breakage for knotting of the ends of the broken yarn extending respectively from said spindle assembly and said take-up assembly; and

yarn transfer means for withdrawing the broken end of yarn from said take-up assembly and positioning the yarn in said knotter means for being knotted with the broken end of yarn from said spindle assembly, said means comprising an uncoiling roller having a fiber attracting surface for engaging the take-up package of yarn in said cradle mechanism and rotating the take-up package in the opposite direction of its take-up rotation for unwinding of the broken end of yarn from the take-up package and winding a predetermined amount of the broken end of yarn onto the uncoiling roller and including selectively-operated drive means for rotation of said uncoiling roller when in engagement with the take-up package and selectively operated positioning means for moving said uncoiling roller between a retracted position out of engagement with the take-up package and an extended position in engagement with the take-up package, said means further comprising yarn transfer wand means for engaging the yarn extending between said coiling roller and the take-up package after said uncoiling roller has wound a predetermined amount of the broken end of yarn from the take-up package thereon and moved to its retracted position and for transferring the yarn by movement thereof while unwinding the yarn from said uncoiling roller to said knotter means for receipt by said knotter means to perform the knotting operation and including means for moving said yarn transfer wand means between the yarn engaging position and the yarn transfer position into said knotter means.

4,137,701

DEVICE FOR FACILITATING THE DOFFING OF FULL BOBBINS ON FLY-FRAMES

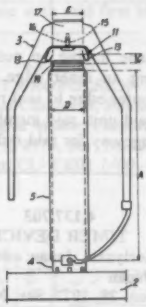
Jean F. Herubel, Guebwiller, France, assignor to N. Schlumberger & Cie, Guebwiller, France

Filed Nov. 23, 1977, Ser. No. 854,335

Claims priority, application France, Dec. 3, 1976, 76 36470

Int. Cl.[2] D01H *9/00, 7/26*

U.S. Cl. 57—267 4 Claims



1. In a fly frame having spindle means mounted for rotation and vertical axial movement, spools frictionally engaged on said spindle means to have bobbins of textile material formed on said spools, and revolving flyer means coaxially mounted above said spindle means and each having a central portion with an underface, the improvement of clamping means carried by said flyer means for temporarily clamping said spool onto said flyer means, said improvement comprising two opposed resilient claws secured to said underface of said central portion of said flyer means and resiliently deformable away from each other, said claws having two clamping edges facing each other, and annular retaining flange means on the upper end portion of each of said spools mating with said two clamping edges of said resilient claws, said flange means having an inner diameter equal to the distance between said clamping edges of said two claws and an outer diameter greater than said distance, said annular retaining flange means being mechanically engaged between said two clamping edges of said claws upon upward movement of said spindle means and of a spool carried thereon, said retaining flange means being disengaged from between said clamping edges by manual lateral movement of said spool.

4,137,702

DOUBLE TORSION TWISTING MECHANISMS

Jean M. Monville, Paris, and Jean Waleckx, Villebon-sur-Yvette, both of France, assignors to SKF Compagnie d'Applications Mecaniques, Clamart, France

Filed Nov. 25, 1977, Ser. No. 854,681

Claims priority, application France, Nov. 30, 1976, 76 36110

Int. Cl.[2] D01H *7/86*

U.S. Cl. 57—58.74 8 Claims

1. A double torsion twisting mechanism comprising:

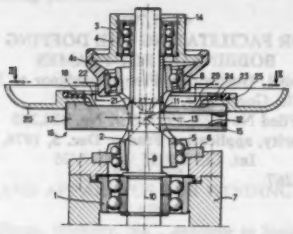
a hollow spindle rotatably mounted in a stationary support for rotation about a main axis,

a rotating part secured to said hollow spindle, said rotating part having a radial yarn guide channel,

a rotating plate secured to said rotating part,

a bobbin-holder rotatably mounted on said spindle for rotation relative to the spindle about said main axis,

a unit rotatably mounted on said support for rotation about an offset axis at an angle to said main axis, said unit being rotatably mounted on a housing of said bobbin-holder for rotation about said offset axis,



a flexible membrane having an outer edge and a central opening defining an inner edge, said membrane being secured by its outer edge to said rotating plate and by its inner edge to said unit, said membrane including at least one radial passageway for said radial yarn guide channel.

4,137,703

TIMER DEVICE

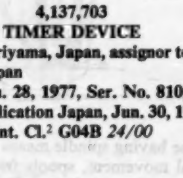
Jusuke Yaginuma, Koriyama, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Jun. 28, 1977, Ser. No. 810,782

Claims priority, application Japan, Jun. 30, 1976, 51-86265[U]

Int. Cl.[2] G04B *24/00*

U.S. Cl. 58—16 D **3 Claims**



1. A timer device comprising a timer setting drum having a cam portion on its side surface, a timer cam disk arranged adjacently to said timer setting drum and having therein a cam portion engageable with the cam portion of said timer setting drum and capable of axially moving to actuate an alarm or the like when the cam portion of said timer cam disk and the cam portion of said timer setting drum engage with each other, a clutch disk arranged between said timer setting drum and timer cam disk and engageable with said timer cam disk and rotating at a speed higher than the rotation of said timer cam disk, and a connecting wheel means arranged adjacently to said timer cam disk and capable of transmitting the rotation of a time indicating member to said timer cam disk and connected with said timer cam disk by pin-slot connection so as to be able to rotate independently of said timer cam disk by a rotation angle necessary to disengage the cam portion of said cam disk from the cam portion of said timer setting drum, said timer cam disk and said clutch disk being engaged with each other simultaneously with the engagement of the cam portion of said timer setting drum and the cam portion of said timer cam disk with each other, and the cam portion of said timer setting drum and the cam portion of said timer cam disk being disengaged with each other by the rotation of said clutch disk.

4,137,704

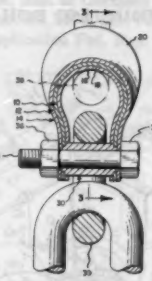
COUPLING SHACKLE

Kenneth D. Schreyer, Clarence, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Sep. 16, 1977, Ser. No. 833,738

Int. Cl.[2] F16G *15/06*

U.S. Cl. 59—86 **9 Claims**



1. In a shackle device comprising an interfitting laminate including inner and outer generally U-shaped members each having bowed intermediate portions extending from generally parallel leg portions formed with apertures disposed in transversely aligned relation, and a connecting pin slide fitted through said apertures to complete said shackle device, the improvement comprising in combination:

a spacer sleeve mounted on a mid-portion of said pin for opposite end engagement with the leg portions of said outer member, said spacer sleeve extending through the apertures of the leg portions of said inner member.

4,137,705

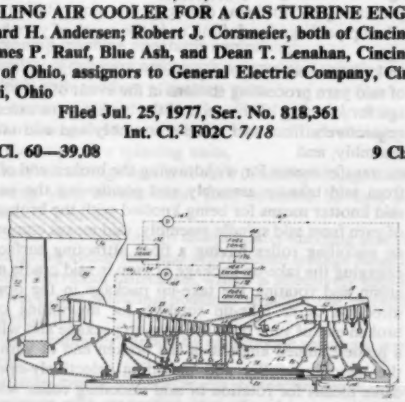
COOLING AIR COOLER FOR A GAS TURBINE ENGINE

Richard H. Andersen; Robert J. Corsmeier, both of Cincinnati; James P. Rauf, Blue Ash, and Dean T. Lenahan, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jul. 25, 1977, Ser. No. 818,361

Int. Cl.[2] F02C *7/18*

U.S. Cl. 60—39.08 **9 Claims**

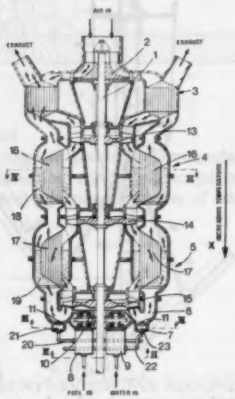


1. A gas turbine engine comprising a compressor for pressurizing air, a turbine having blades of the air-cooled variety, an engine lubrication system, and a heat exchanger rotatable with said compressor and having a first inlet in fluid communication with said compressor for receiving pressurized air therefrom, a second inlet in fluid communication with said lubrication system for receiving lubricant therefrom and an outlet for said pressurized air in fluid communication with said turbine blades.

4,137,706
ENGINE IN WHICH FUEL IS REACTED IN A PLURALITY OF STAGES

John M. Clarke, Banbury, England, assignor to Noel Penny Turbines Limited, Coventry, England

Filed May 12, 1977, Ser. No. 796,153
Claims priority, application United Kingdom, May 14, 1976, 19958/76
Int. Cl.[2] F02C *3/20*; F02B *43/00*
U.S. Cl. 60—39.12 8 Claims



1. An engine comprising a first reaction chamber to which at least one reactant is introduced to produce, by an endothermic chemical reaction, under substantially reversible conditions, in said first reaction chamber, a combustible product, means defining an air passage in heat exchange relationship with said first reaction chamber, means for introducing the combustible product into said air passage, a second reaction chamber to which air from said air passage together with the combustible product from said first reaction chamber are passed to effect an exothermic chemical reaction in said second reaction chamber, heat exchange means in said second reaction chamber defining with said second reaction chamber a first heat exchange path through which air is led to said air passage and a second heat exchange path, in indirect heat exchange relation to said first heat exchange path, through which air and said combustible product are passed to effect said exothermic chemical reaction and to impart heat to air passing through said first heat exchange path to said air passage, air-path defining means, including said first heat exchange path and said air passage connected in series, and power-producing means positioned in said air-path defining means and through which air flowing through said air passage is passed during operation of the engine.

4,137,707
INTEGRATED CONTROL SYSTEM FOR A GAS TURBINE ENGINE

Robert P. Wanger, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 22, 1977, Ser. No. 818,256
Int. Cl.[2] F02C *9/08*
U.S. Cl. 60—39.28 R 17 Claims

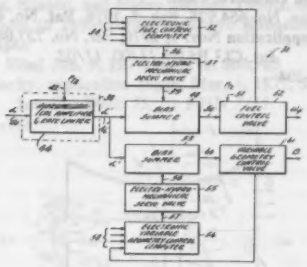
1. An integrated control system for use with a gas turbine engine, said system comprising:

a fuel control valve adapted to meter the flow of fuel to said gas turbine engine;

back-up control means for providing a signal to said fuel control valve, said valve adapted to meter the flow of fuel to said engine in accordance with said signal;

primary control means for providing a first bias signal useable in biasing said signal; and

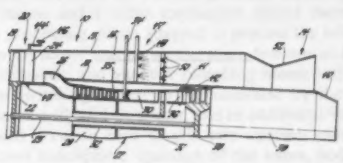
first biasing means for biasing said signal in accordance with said first bias signal during a first normal mode of operation wherein said primary control means are in an operative condition, said fuel control valve receiving said signal biased in accordance with said first bias signal.



4,137,708
JET PROPULSION

Robert H. Aspinwall, and Charles R. Baker, both of Zionsville, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1973, Ser. No. 377,069
Int. Cl.[2] F23R *1/00*
U.S. Cl. 60—204 2 Claims



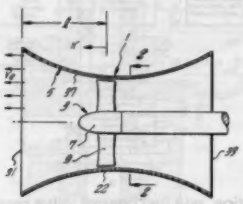
1. A method of operating a jet propulsion engine over a wide range of forward speed, the engine including an inlet duct having a forward fan therein with variable flow guide vanes, a fan duct downstream of the inlet duct including a burner, a core gas generator engine downstream of the inlet duct, the core gas generator engine including a high pressure turbine, a variable nozzle and fan turbine coupled to the fan and being energized from the core engine, and first and second variable jet nozzles supplied respectively from the fan duct and the fan turbine, the method comprising: supplying fuel through the core engine and duct burner for operation as a normal duct-burning bypass engine from zero forward speed up to a supersonic value of forward speed; progressively reducing core engine fuel following attainment of the supersonic value of forward speed to a fuel cut off point at a supersonic transition forward speed; and at speeds above the supersonic transition forward speed supplying predetermined ram heated and pressurized air from the inlet duct to the core engine; controlling the variable flow guide vanes to reduce flow to the core engine; adjusting the variable flow guide vanes to reduce flow of the predetermined ram heated and pressurized air; adjusting the variable nozzle to control the expansion ratio of the reduced flow as it passes across the high pressure turbine to produce a regulated extraction of energy from the reduced flow to produce a controlled auxiliary power output from the core gas generator engine; concurrently opening the second variable jet nozzle to increase the expansion ratio across the fan turbine as ram heated and pressurized air flows through the core engine to extract energy therefrom to drive the fan to supercharge the duct burner during a range of forward speed higher than the transition value, and supplying fuel to the fan duct burner at speeds in excess of the transition value and controlling the first variable jet nozzle to be more opened.

4,137,709

TURBOMACHINERY AND METHOD OF OPERATION

Calvin A. Gongwer, Glendora, Calif., assignor to Innerspace Corporation, Glendora, Calif.

Division of Ser. No. 654,925, Feb. 3, 1976, Pat. No. 4,055,947.
This application Nov. 1, 1976, Ser. No. 737,065
Int. Cl.[2] B63H 11/00, 11/02
U.S. Cl. 60—204 9 Claims



1. A method of operating turbomachinery having an impeller with a plurality of blades mounted about a central rotatable hub, said impeller being positioned within a diffuser and adjacent the diffuser throat comprising:

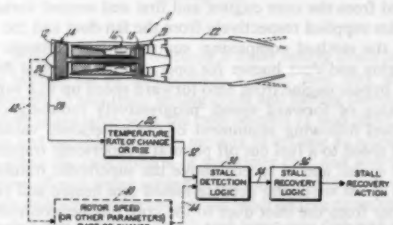
imparting an increased pressure head at the blade tip and root sections as constrasted with the pressure head imparted at the blade midsection.

4,137,710

SURGE DETECTOR FOR GAS TURBINE ENGINES

Edmond Preti, North Palm Beach, and Howard W. Ripy, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 26, 1977, Ser. No. 762,763
Int. Cl.[2] F02C 7/22
U.S. Cl. 60—223 6 Claims


TEMPERATURE RATE OF CHANGE OR RISE
STALL DETECTION LOGIC
STALL RECOVERY LOGIC
STALL RECOVERY ACTION
ROTOR SPEED (OR OTHER PARAMETER) RATE OF CHANGE COMPUTATION

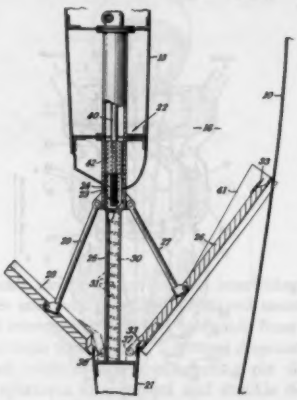
1. In combination, a turbine type power plant having a compressor, an engine inlet leading air into said compressor and an augmentor, means for detecting surge when it is initiated in said compressor when said augmentor is in the operating condition occasioned by the normally rearward flowing of exhaust gases reversing itself and flowing through the engine and heating the engine inlet air, said means including a sensor disposed in said inlet for measuring the temperature of the air therein, and calculating means for producing an output signal as a function of the rate of change of said measured temperature when it exceeds a predetermined value, whereby said output signal is indicative of surge in said compressor.

4,137,711

GAS TURBINE ENGINES

Ronald Montgomery, Belfast, Ireland, assignor to Short Brothers & Harland Limited, Belfast, Ireland

Filed May 24, 1977, Ser. No. 800,073
Claims priority, application United Kingdom, Jun. 8, 1976, 23722/76
Int. Cl.[2] F02K 1/20, 3/06
U.S. Cl. 60—226 A 16 Claims



1. A gas turbine engine comprising a duct for the passage of a thrust producing gas, the duct having an upstream portion and a downstream portion spaced apart in a direction parallel to the axis of the duct, the downstream portion being movable relatively to the upstream portion in the said axial direction between a closer spaced position and a further spaced position, a plurality of thrust reversal doors pivotally connected to an upstream end of the downstream portion and extending therefrom towards the upstream portion, and a linkage assembly having a one end fixed relatively to the upstream portion and acting on each thrust reversal door at a point on the door spaced axially from the pivotal connection of the door to the downstream portion, the linkage assembly during movement of the downstream portion to the closer spaced position causing the thrust reversal doors to pivot to open the space between the upstream and downstream portions and to close or substantially close the duct for the reversal of thrust when the downstream portion reaches said closer spaced position and during movement of the downstream portion to the further spaced position, causing return pivoting of the thrust reversal doors to close or substantially close the space between the upstream and downstream portions and to leave the duct unobstructed or substantially unobstructed by the doors when the downstream portion reaches said further spaced position.

4,137,712

FLUIDIC COMBUSTION CONTROL OF A SOLID FUEL RAMJET

Allen L. Holzman, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 702,642, Jul. 6, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 840,939
Int. Cl.[2] F02K 7/10
U.S. Cl. 60—251 6 Claims

1. A fluidic combustion control system for a solid fuel ramjet comprising;

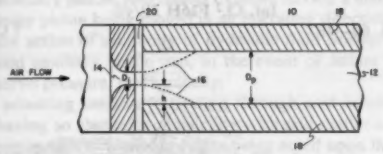
a ramjet casing;

a sustainer region in said casing lined with a solid fuel having an internal diameter D_p and having a head end;

an injector means forwardly of said sustainer region and having an internal diameter D_i,

a recirculation zone at the head end of said sustainer region and adjacent said injector means,

said solid fuel normally having a critical injection parameter h/D_p below which combustion will not be sustained where h equals $\frac{1}{2}(D_p - D_i)$;



a source of gas; and

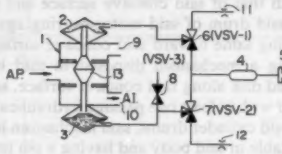
means for introducing said gas into said recirculation zone to control the combustion within said sustainer region by altering the critical injection parameter of said solid fuel.

4,137,713

INTERNAL COMBUSTION ENGINE SECONDARY AIR INJECTION COMPENSATING SYSTEM

Keiso Takeda, Susono, and Hideo Miyagi, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 31, 1977, Ser. No. 801,760
Claims priority, application Japan, Mar. 11, 1977, 52-26090
Int. Cl.[2] F02B *75/10*; F01N *3/10*
U.S. Cl. 60—276 **2 Claims**



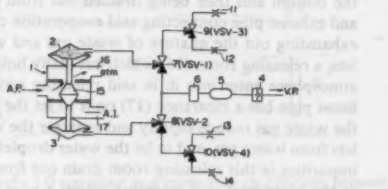
1. In an internal combustion engine having an exhaust system provided with exhaust gas purifying means and secondary air supply means disposed upstream thereof; a secondary air injection compensating system comprising vacuum introducing means adapted to introduce intake manifold vacuum from an intake manifold vacuum port through a vacuum transmitting valve into a vacuum reservoir and reserve the manifold vacuum in said reservoir; secondary air switching means including two diaphragm means and a valve mechanism linked therewith; information processing means adapted to process the information from an O_2 sensor and an acceleration detector to make a selection therefrom and issue a command; vacuum switching means including two vacuum switching valves for selective conduction of said vacuum to said secondary air switching means by said command and a compensating switching valve; and means responsive to detection of acceleration to cause said compensating switching valve to communicate atmospheric air to a diaphragm for more rapid initiation of secondary air injection, said information processing means being adapted to simultaneously communicate one of said two vacuum switching valves with the vacuum and the other with the atmosphere and, under the secondary air injecting condition, cause said compensating switching valve to induce atmospheric air into the atmosphere communication system, thereby precisely operating said valve mechanism.

4,137,714

INTERNAL COMBUSTION ENGINE SECONDARY AIR SUPPLY CONTROL SYSTEM

Keiso Takeda, Susono, and Hideo Miyagi, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 9, 1977, Ser. No. 804,985
Claims priority, application Japan, Mar. 4, 1977, 52-22802
Int. Cl.[2] F02B *75/10*; F01N *3/15*
U.S. Cl. 60—276 **1 Claim**



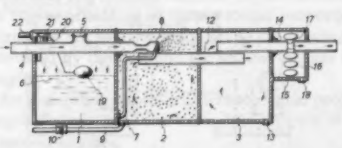
1. In an internal combustion engine having an exhaust system provided with exhaust gas purifying means and secondary air supplying means disposed upstream thereof; a secondary air supply control system comprising vacuum introducing means adapted to introduce intake manifold vacuum from an intake manifold vacuum port through a vacuum transmitting valve into a vacuum reservoir and reserve the manifold vacuum in said reservoir; secondary air switching means including two diaphragm means and a valve mechanism linked therewith; information processing means adapted to process the information from an O_2 sensor and an acceleration detector and issue selective commands; and vacuum switching means including two vacuum switching valves to be controlled by the command associated with said O_2 sensor, and an additional vacuum valve disposed between each of said two vacuum switching valves and two atmosphere openings of the valve, both said additional vacuum valves being adapted to be controlled by the command associated with said acceleration detector, said two atmosphere openings of each additional vacuum valve being provided with respective orifices of different throttling capabilities.

4,137,715

FOG SMOKE-FILTRATING AND MUFFLING DEVICE UTILIZED BY VEHICLE

Ho Tung-lung, No. 14, Alley 46, Sung Chiang Rd., Taipei, and Lin Ping-ho, 1st Fl., No. 110-5, Sec. 2, San Min Rd., Pan Chiao, Taipei Hsien, both of Taiwan

Filed Jul. 29, 1976, Ser. No. 709,896
Int. Cl.[2] F01N *3/04, 7/12*; B01D *47/00*
U.S. Cl. 60—310 **3 Claims**



1. A fog smoke-filtrating and muffling device utilized by vehicle which comprises:

an intake pipe (4) in connection with the engine of vehicle for leading the waste gas into a water tank (22), in which said intake pipe has an opening for permitting part of the waste gas from the engine entering into said water tank to press the water into a pipe which is connected to a mixture chamber (2); said water tank containing the water so that the noise and shock of the engine can be absorbed by the water; said intake pipe extending into said mixture chamber has a contracted exit, by which the waste gas can be

accelerated to blow the water droplets which came from the nozzle of said pipe to disperse to become fogs and increasing the pressure of waste gas in passing through said opening of said intake pipe; a connecting pipe (12) for connection between the said mixture chamber and an evaporation chamber (3) which has an outlet opened at bottom; the said outlet providing the mixture of the waste gas and small water droplets coming from said mixture chamber to evaporate or to adhere to the surface of the wall of said evaporation chamber (3) and falling down to the bottom and then being drained out from said outlet; and exhaust pipe connecting said evaporation chamber for exhausting out the mixture of waste gas and water droplets; a releasing room (16) which has many holes to let the atmosphere enter into it; in said releasing room, said exhaust pipe has a clearance (17) on it to let the pressure of the waste gas reduce rapidly and separate the water droplets from waste gas, and to let the water droplets and other impurities in this releasing room drain out from the holes at the bottom of said releasing room; a pipe connecting said mixture chamber and reservoir for flowing the water droplets in said mixture chamber into said reservoir; another pipe (22) connecting said reservoir with said water tank for flowing back the water in said reservoir into said water tank.

4,137,716

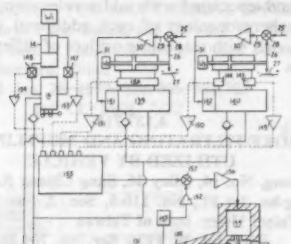
LOAD RESPONSIVE SYSTEM PUMP CONTROLS

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation of Ser. No. 756,618, Jan. 4, 1977, Pat. No. 4,074,529. This application Aug. 29, 1977, Ser. No. 828,648

Int. Cl.[2] F16H *39/46*

U.S. Cl. 60—445 **17 Claims**



1. A fluid power and control system comprising a fluid pump, a fluid motor driving a load, and valve means interposed between said pump and said motor to control said load, flow changing means operable to vary fluid flow delivered from said pump to said fluid system to vary pressure in said fluid system, control signal generating means to generate a control signal proportional to magnitude of said load, and control means responsive to said control signal having means operable through said flow changing means to maintain a preselectable relatively constant ratio between pressure of said fluid system and pressure necessary to support said load.

4,137,717

HYDROSTATIC TRANSMISSION

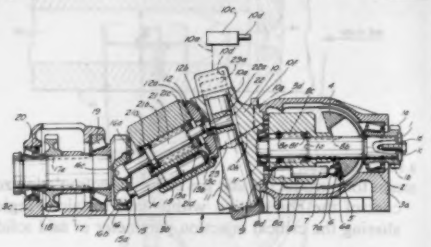
Franz Forster, Mühlbach, Fed. Rep. of Germany, assignor to Linde AG, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 26, 1977, Ser. No. 819,145

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633717

Int. Cl.[2] F16H *39/46*

U.S. Cl. 60—487 **7 Claims**



1. A hydrostatic transmission comprising:

a housing;

a hydrostatic inclined-disk variable-displacement pump in said housing and having a cylinder drum;

a drive-flange hydrostatic motor in said housing having a cylinder drum;

an intermediate body in said housing between said pump and said motor, said body being formed with a cylindrically concave surface turned toward said motor and having an axis of curvature defining a tilt axis for said drum of said motor;

an intermediate disk disposed between said drum of said motor and said surface of said body, said disk having a convex cylindrical surface and a radius of curvature corresponding to that of said concave surface and shiftable therealong, said drum of said motor bearing against said disk and urging same toward said concave surface; and

means including a mechanism disposed in said body for displacing said disk along said concave surface, said body being formed with at least one passage hydraulically interconnecting said cylinder drums, said mechanism including a piston shiftable in said body and having a pin projecting through said concave surface and engaging said disk.

4,137,718

POWER BRAKE UNIT

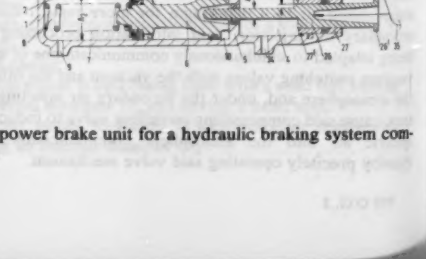
Juan Belart, Walldorf, Hessen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,122

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615805

Int. Cl.[2] B60T *13/20*

U.S. Cl. 60—551 **24 Claims**



1. A power brake unit for a hydraulic braking system comprising:

a housing;

an auxiliary piston disposed in said housing operated on one side thereof by a servo pressure fluid for pressurizing a body of hydraulic fluid on the other side of said auxiliary piston;

a master cylinder disposed in said housing parallel to said auxiliary piston, said master cylinder having a master-cylinder piston being moved in an operating direction under the action of said body of hydraulic fluid pressurized by said auxiliary piston and, in the event of failure of said servo pressure, mechanically;

an actuating member extending through said housing and having an abutment connection with said master-cylinder piston, said actuating member being acted upon in operation to said operating direction by said pressurized body of hydraulic fluid; and

a valve arrangement disposed in said auxiliary piston to control said servo pressure fluid;

said auxiliary piston being moved in said operating direction directly by said servo pressure fluid; and

said actuating member having a lateral extension disposed in said housing connected to said valve arrangement for control thereof.

4,137,719

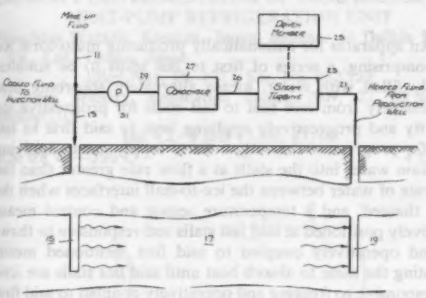
METHOD FOR ENERGY EXTRACTION FROM HOT DRY ROCK SYSTEMS

Robert W. Rex, 2780 Casalero Dr., La Habra, Calif. 90631

Filed Mar. 17, 1977, Ser. No. 778,388

Int. Cl.[2] F03G 7/04

U.S. Cl. 60—641 **11 Claims**



1. A method of operating a hot dry rock geothermal system in which a fluid is injected into an injection well, passes through a geothermal reservoir formation and is recovered in a production well and flashed into a vapor, from which energy is extracted, the improvement comprising utilizing as the fluid a mixture of a ketone and water thereby substantially eliminating problems with scale formation in the system when the heated fluid is flashed to steam and also permitting, because of the lower boiling point of the mixture, operating with geothermal formations having lower rock temperatures.

4,137,720

USE OF CALCIUM HALIDE-WATER AS A HEAT EXTRACTION MEDIUM FOR ENERGY RECOVERY FROM HOT ROCK SYSTEMS

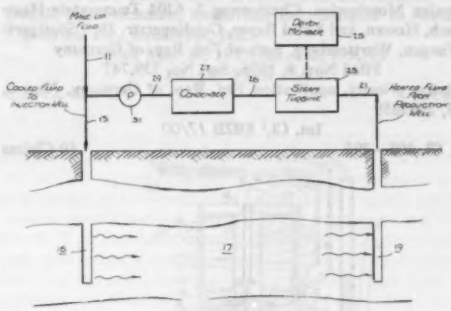
Robert W. Rex, 2780 Casalero Dr., La Habra, Calif. 90631

Filed Mar. 17, 1977, Ser. No. 778,441

Int. Cl.[2] F03G 7/04

U.S. Cl. 60—641 **10 Claims**

1. An improved heat extraction fluid for use in hot, dry rock geothermal systems comprising a brine mixture of water and a calcium halide, said mixture having a specific gravity of approximately 1.4 to 1.5 when at a temperature of approximately 20° C, whereby when said brine is injected to and heated by the hot, dry rock formation its specific gravity will be reduced to



approximately 1.0 resulting in a more energy efficient pressure gradient in the geothermal system.

4,137,721

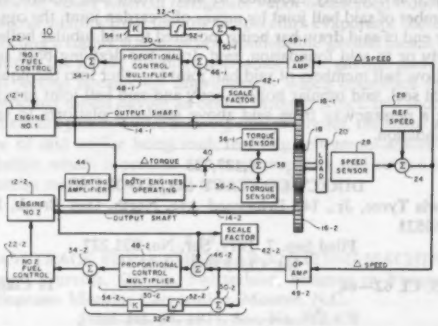
CONTROL SYSTEM FOR PLURAL ENGINES

Timothy F. Glennon, and Dennis T. Faulkner, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 22, 1977, Ser. No. 818,066

Int. Cl.[2] F01B 21/00

U.S. Cl. 60—711 **11 Claims**



4. In a power plant having a first and a second engine, the outputs of which are coupled together for isochronous operation, each engine providing an output torque proportional to a control signal, an improved control circuit for assuring that the torque provided by the first and the second engines is shared comprising:

means for generating a torque difference signal proportional to any difference between the output torques of the first and second engines;

means for generating a speed error signal proportional to any difference between a selected reference speed and the actual speed of the engines;

means for combining said speed error signal with said torque difference signal in one sense to provide a control signal for the first engine;

means for combining said speed error signal with said torque difference signal in the opposite sense to provide a control signal for the second engine; and

means for controlling each of said engines in accordance with the control signal therefor.

4,137,722

COUPLING BETWEEN AN ABOVE SEA-LEVEL PLATFORM AND A BELOW-WATER FOUNDATION

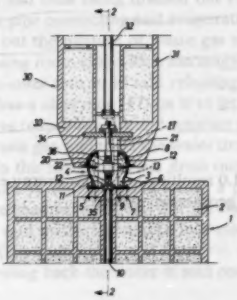
Varoujan Mossiossian, Chattenweg 2, 6204 Taunusstein-Hambach, Hessen, and Karol Bayer, Geislingerstr. 19, 7 Stuttgart-Wangen, Wurttemberg, both of Fed. Rep. of Germany

Filed Nov. 8, 1976, Ser. No. 739,747

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1975, 2549859

Int. Cl.[2] E02B *17/00*

U.S. Cl. 405—202 **10 Claims**



1. A coupling for an above sea-level platform and a foundation secured to the sea bed, said platform having a tubular hollow body, a ball joint consisting of two hollow ball members connecting said tubular hollow body to said foundation, said ball joint being partly hollow in construction and having a tensioned draw member to ensure a liquid-tight seal in said ball joint, said draw member comprising a draw bar one end of which is rotatably mounted to and within one hollow ball member of said ball joint by means of a cardan joint, the opposite end of said draw bar being mounted to said tubular hollow body or to said foundation, said draw bar drawing both said hollow ball members of said ball joint together into the liquid-tight seal, said tubular hollow body and said ball joint providing a passageway from said above sea-level platform to said foundation.

4,137,723

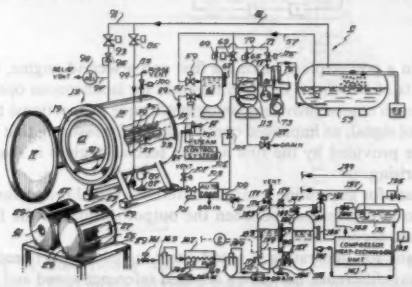
DIRECT CONTACT CO_2 COOLING

Lewis Tyree, Jr., 145 Briarwood Ave. North, Oak Brook, Ill. 60521

Filed Sep. 7, 1977, Ser. No. 831,227

Int. Cl.[2] F25D *17/02*

U.S. Cl. 62—64 **11 Claims**



1. A method of cooling material by direct contact with CO_2, which method comprises

supplying CO_2 to a holding tank from a liquid CO_2 storage vessel system,

creating a coolant reservoir in said holding tank wherein CO_2 vapor, CO_2 liquid and solid CO_2 exist in equilibrium in the form of slush plus vapor,

disposing material to be cooled in a chamber,

injecting liquid CO_2 into said cooling chamber for the purpose of cooling material by direct contact therewith, thereby creating contaminated CO_2 vapor,

removing said contaminated CO_2 vapor from said chamber and directing same to said coolant reservoir to condense said CO_2 vapor and any contaminants which liquefy at temperatures above $-69°$ F. by melting solid CO_2,

withdrawing CO_2 vapor from said holding tank for return to said CO_2 storage vessel system,

reliquefying said withdrawn CO_2 vapor, and

periodically removing condensable contaminants from said holding tank.

4,137,724

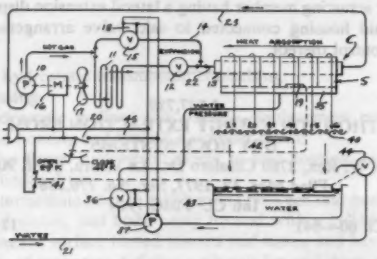
APPARATUS FOR PRODUCING ICE

Robert W. Alexander, Pasadena, Calif., assignor to Armalite, Inc., Costa Mesa, Calif.

Filed Apr. 22, 1974, Ser. No. 462,887

Int. Cl.[2] F25C *1/04*

U.S. Cl. 62—138 **7 Claims**



1. An apparatus for automatically producing multi-form ice and comprising, a series of first to last stalls to be simultaneously filled with water, means alternately absorbing heat progressively from said first to last stalls for progressive ice maturity and progressively applying heat to said first to last stalls for progressive thawing, a water supply means applying floatation water into the stalls at a flow rate greater than the flow rate of water between the ice-to-stall interfaces when the ice is thawed, and a temperature sensor and control means selectively positioned at said last stalls and responsive to thawing and operatively coupled to said first mentioned means activating the same to absorb heat until said last stalls are iced and responsive to freezing and operatively coupled to said first mentioned means activating the same to apply heat until the ice-to-stall interfaces at said last stalls are thawed and operatively coupled to said water supply means activating the same to apply water into the stalls at said greater flow rate to float and eject the thawed ice therefrom.

4,137,725

COMPRESSOR CONTROL FOR A REVERSIBLE HEAT PUMP

Robert L. Martin, Little Silver, N.J., assignor to Fedders Corporation, Edison, N.J.

Filed Aug. 29, 1977, Ser. No. 828,759

Int. Cl.[2] F25B *13/00, 29/00*

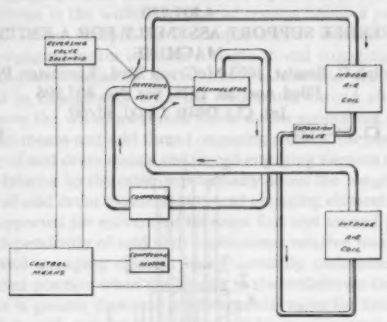
U.S. Cl. 62—160 **5 Claims**

1. In combination with a compressor operated reversible heat pump, control means operable to deactivate the compressor of the heat pump upon switching of modes of the heat pump from heating to defrosting thereby to prevent damage to the compressor due to pressure differences in the heat pump, said control means comrising:

mode responsive switch operable, in response to the switching of modes of the heat pump between the heating and defrosting modes, to deactivate the compressor; and

a timer switch operable to reactivate the compressor subse-

quent, by a predetermined period of time sufficient to allow substantial equalization of pressures in the refrigerant system of the heat pump, to the deactivation of the compressor by the mode responsive switch.



4,137,726

CAPACITY CONTROL SYSTEM OF COMPRESSOR FOR HEAT-PUMP REFRIGERATION UNIT

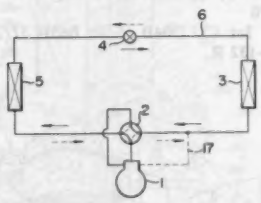
Masahiro Watada, Kusatsu, Japan, assignor to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Nov. 18, 1977, Ser. No. 852,733

Claims priority, application Japan, Nov. 22, 1976, 51-156934[U]

Int. Cl.[2] F25B *13/00, 41/00*

U.S. Cl. 62—196 C 4 Claims



1. A capacity control system of a compressor for a heat-pump refrigeration unit comprising:

bypass port means formed in a wall of a cylinder chamber of the compressor and adapted to open into a portion of the cylinder chamber in which portion the compression stroke is effected;

bypass means communicating said bypass port means with the suction side of the compressor; and

valve means mounted in said bypass port means for opening and closing said bypass means, said valve means having its back acted upon by the pressure fed from a refrigerant passage, which becomes a low pressure area in a cooling mode operation of the refrigeration unit and becomes a high pressure area in a heating mode operation thereof, in such a manner that the valve means can be automatically opened or closed to open or close said bypass means dependent upon change in the pressure within said refrigerant passage.

4,137,727

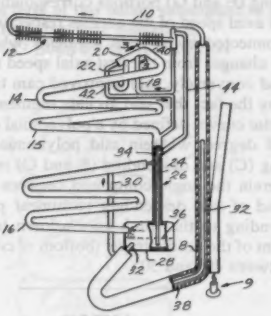
ABSORPTION REFRIGERATION SYSTEM WITH PRECOOLER AND INERT GAS CONTROL

Donald Kuhlenschmidt, Evansville, Ind., assignor to Arkla Industries, Inc., Evansville, Ind.

Filed May 23, 1977, Ser. No. 799,781

Int. Cl.[2] F25B *15/10*

U.S. Cl. 62—490 6 Claims



1. In an absorption refrigeration system of the kind including a low-temperature evaporator vessel wherein relatively cold liquid refrigerant evaporates in the presence of a first stream of non-condensible pressure equalizing gas, a liquid refrigerant precooler wherein relatively warm liquid refrigerant is cooled by partial evaporation into a second stream of the non-condensible gas, means conveying relatively cold liquid refrigerant from the precooler to the low-temperature evaporator, an absorber vessel wherein refrigerant vapor is absorbed from the gaseous mixture from the low temperature evaporator thereby effecting a supply stream of non-condensible gas and means for splitting the supply stream of non-condensible gas into said first and second streams the improvement which comprises flow restricting means having an orifice through which said second gas stream passes before entering said precooler, the shape and size of said orifice being such that any refrigerant-absorbent solution which is present will not creep into said orifice and thereby restrict flow of gas therethrough.

4,137,728

CAM TRACK FOR A CIRCULAR KNITTING MACHINE

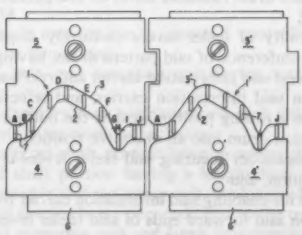
Gerard Durville, Geneva, Switzerland, assignor to Vanguard Supreme Machine Corporation, Monroe, N.C.

Filed Jul. 14, 1977, Ser. No. 815,478

Claims priority, application Switzerland, Apr. 29, 1977, 5346/77

Int. Cl.[2] D04B *15/32*

U.S. Cl. 66—57 4 Claims



1. Improved cam track for a circular knitting machine which comprises needles installed in a needle cylinder supported on the machine frame for rotation around a longitudinal axle, each needle being fitted so as to slide within a guiding groove di-

rected peripherally along said needle cylinder and being provided with a butt protruding from said groove and including upper and lower sides which are oriented perpendicular to said groove, said upper and lower sides of said butt engaging between two opposing cam surfaces supported on the machine frame, said opposing cam surfaces defining together said cam track which is constituted by a plurality of successive cam track sections mounted side by side around said needle cylinder and comprising alternate rectilinear ascending (C) and descending (E and G) portions corresponding to a first and to a second axial speed of the needles respectively, such portions being connected by arcuate segments whereby the needles undergo changes from the first axial speed to the second axial speed and conversely, said improved cam track being characterized by the fact that said arcuate segments (B, D, F, H and I) comprise curves defined by a polynomial equation of at least the third degree, wherein said polynomial curves join said ascending (C) and descending (E and G) rectilinear portions, and wherein the angle comprised between a line joining the lower end of said descending rectilinear portion (E and G) corresponding to the stitch knock-down level to the lowest dead point of the needle travel (bottom of curved cam segment H) is between 40° and 50°.

4,137,729

PATTERN DEVICE FOR A KNITTING MACHINE

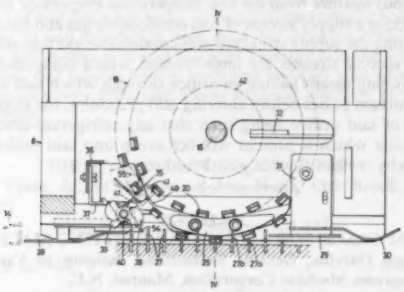
Peter Engler, Niederhasli, and Georg Heller, Boswil, both of Switzerland, assignors to MADAG Maschinen - und Apparatebau Dietikon AG, Dietikon, Switzerland

Filed Feb. 24, 1978, Ser. No. 880,843

Claims priority, application Switzerland, Feb. 28, 1977, 2514/77

Int. Cl.² D04B *7/00, 15/66*

U.S. Cl. 66—75.1 **8 Claims**



1. In a pattern device for a knitting machine having a needle bed, of the type including

an information carrier,

a pattern drum rotatable about an axis parallel to said needle bed,

a plurality of feeler levers uniformly disposed about the circumference of said pattern drum, having forward ends nearest said information carrier and rearward ends remote from said information carrier, and selectively pivotable from a resting position against the outside surface of said pattern drum into an operative position,

stop means for securing said feeler levers in said operative position, and

means for enabling said information carrier to act selectively upon said forward ends of said feeler levers,

the improvement which comprises:

cam means for controlling and limiting a pattern-interruption phase,

a retaining guide disposed adjacent to said pattern drum, and switch means actuated by said cam means for selectively causing said rearward ends of said feeler levers to pass within said retaining guide, said feeler levers being of a springy or articulated construction.

4,137,730

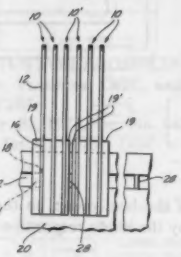
NEEDLE SUPPORT ASSEMBLY FOR A KNITTING MACHINE

Rudolph G. Bassist, 1003 McGrann Blvd., Lancaster, Pa. 17601

Filed Apr. 20, 1978, Ser. No. 897,996

Int. Cl.² D04B *15/00, 35/00*

U.S. Cl. 66—114 **8 Claims**



1. A needle support assembly for a knitting machine, comprising a needle support member, a row of knitting needles arranged against said support member, and a spacer between each two successive needles, said spacers being independent of said needles and said support member and being of precisely equal thicknesses, so that each two successive needles in the row are spaced apart the same predetermined distance.

4,137,731

THREAD SUPPLY DEVICE FOR TEXTILE MACHINE HAVING COMMON THREAD CONTROL AND TENSION SENSING ELEMENT

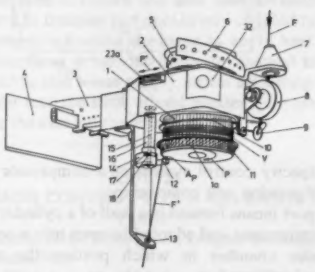
Kurt A. G. Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Feb. 4, 1977, Ser. No. 765,689

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1976, 2605370

Int. Cl.² D04B *15/48;* B65H *51/20*

U.S. Cl. 66—132 R **5 Claims**



1. In a thread supply device for a textile machine, in particular a knitting machine, said thread supply device including drum means upon which a thread can be tangentially wound to form an intermediate thread storage and from which the thread can be unwound axially over a withdrawal rim associated with the drum means, a stationary thread guide member disposed in axially spaced relationship from the withdrawal rim for guiding the thread withdrawn from said drum means after it passes over the withdrawal rim, thread engagement means positioned for engagement with the withdrawn thread as it extends from said withdrawal rim to said thread guide member for (1) limit-

ing the maximum rate at which the thread can be withdrawn from the drum means and (2) sensing the tension in the withdrawn thread, and switching means interconnected to said thread engaging means and actuated in response to the sensing of a decrease in the withdrawn thread tension below a predetermined value, comprising the improvement wherein said thread engaging means includes a single thread engaging element positioned adjacent the withdrawal rim and normally disposed in engagement with the withdrawn thread after it passes over the withdrawal rim, frame means supporting both said drum means and said thread engaging element for permitting one of said drum means and thread engaging element to be rotated relative to the other substantially about the longitudinal axis of said drum means, said thread engaging element also being supported for movement between first and second positions independently of said above-mentioned relative rotation, said thread engaging element being normally maintained in said second position when the tension in the withdrawn thread equals or is greater than said predetermined value for limiting the withdrawal rate of thread from said drum means, and means for normally urging the thread engaging element away from said second position toward said first position, whereby a decrease in the thread withdrawal tension permits the thread engaging element to move toward the first position and into said first position when the thread withdrawal tension falls below said predetermined value.

4,137,732

YARN FEED AND YARN CHANGE MECHANISM

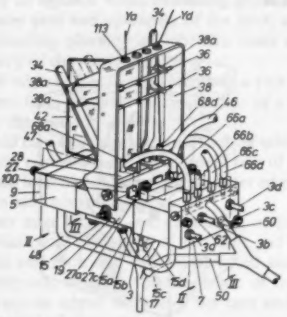
Daniel W. F. Gostelow, and Peter M. Findlay, both of Leicester, England, assignors to Wildt Mellor Bromley Limited, Leicester, England

Filed Sep. 14, 1977, Ser. No. 833,263

Claims priority, application United Kingdom, Sep. 18, 1976, 38792/76

Int. Cl.² D04B *15/60*

U.S. Cl. 66—140 R **18 Claims**



1. Yarn feed and yarn change mechanism including a plurality of inlet yarn feed passages, a plurality of outlet yarn feed passages one associated with each of the inlet passages, a pneumatic means for providing a flow of fluid from each of the inlet passages to the associated outlet passage, a yarn cutting and trapping arrangement between each of the associated inlet and outlet passages comprising a control element, a yarn control passage in the control element, a trapper between the inlet passage and the control passage, severing means between the control passage and the outlet passage, and means for moving the control elements individually between a feed position in which the control passage joins the inlet and outlet passages and wherein the pneumatic means is able to propel a leading end of yarn to the outlet passage and a trap position in which the control passage holds yarn under the trapper after severing the yarn on moving from the feed to the trap position.

4,137,733

SLIDE-FASTENER-STRINGER HALF WITH KNITTED-IN COUPLING ELEMENTS AND METHOD OF MAKING SAME

Helmut Heimberger, Locarno, Switzerland, assignor to Optilon W. Erich Heilmann GmbH, Cham, Switzerland

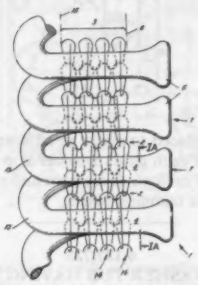
Continuation-in-part of Ser. No. 728,034, Sep. 30, 1976, Pat. No. 4,075,874. This application Jun. 3, 1977, Ser. No. 803,312

Claims priority, application Fed. Rep. of Germany, May 20, 1976, 2622529

The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.

Int. Cl.² B04B *21/00*; A44B *19/34*

U.S. Cl. 66—195 **7 Claims**



1. A slide-fastener stringer half comprising a knit tape comprising a full-tricot ground knit and having a plurality of parallel longitudinally extending wales and a plurality of transversely extending courses, and a monofilamentary coupling element on said tape and having a succession of turns each having a pair of shanks and a coupling head joining said shanks and projecting transversely beyond a longitudinal edge of said tape, said shanks of each turn lying at least in a region adjacent said head in a plane generally perpendicular to said tape, said tape comprising at least one warp yarn forming a chain knitted into said tape only at every other course and overlying said shanks at said regions, whereby said shanks are laid onto said tape and into said chain at said regions, said warp yarn being tensioned to draw the tape into fold-like channels receiving each pair of shanks.

4,137,734

JACQUARD CONTROLLED WARP KNITTING MACHINES AND YARN GUIDE UNITS THEREFOR

Karl Kohl, Obertshausen, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,430

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621797

Int. Cl.² D04B *15/64*

U.S. Cl. 66—214 **4 Claims**

1. A yarn guide unit for use in jacquard controlled warp knitting machines comprising:

(a) a mounting unit, said mounting unit having a transverse axis; and,

(b) a plurality of unitary yarn guide members each guide member comprising three portions including:

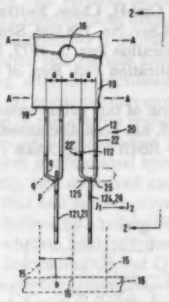
(i) a flat elongated shaft portion lying in a predetermined plane, said shaft portion having a longitudinal axis and being mounted in said mounting unit, the longitudinal axis of said shaft portion being perpendicular to the transverse axis of said mounting unit and lying in a common plane therewith, the planes of the shaft portions of said plurality of guide members being oriented parallel to each other;

(ii) a central portion connected to said flat portion; and,

(iii) a flat elongated head portion connected to said central portion, said flat head portion lying in a predetermined

plane and having an eyelet in the end thereof farthest from said central portion;

wherein each said guide unit includes at least two guide members, the head portion of at least one guide member of each unit



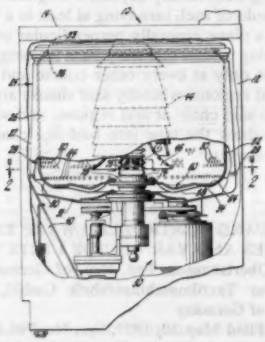
being laterally displaced towards an adjacent member so that the head portion of each guide member is in a plane parallel to the shaft portion of each guide member and all head portions of a guide unit lie in a common plane.

4,137,735

CLOTHES WASHER TUB HAVING IMPROVED WASHABILITY MEANS

James A. Bright, Dayton, and Homer W. Deaton, Bellbrook, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 11, 1977, Ser. No. 840,773
Int. Cl.[2] D06F *13/04, 39/06*
U.S. Cl. 68—18 D **1 Claim**



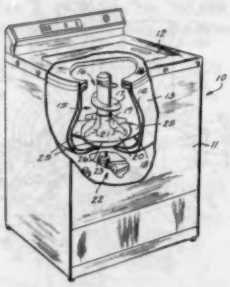
1. In a domestic clothes washer having an imperforate stationary outer water container configured to contain washing fluid and an open-top spin tub nested within said container in spaced relation thereto and having an agitator therein, said spin tub configured to include an imperforate bottom wall having a generally dished configuration, a vertically upwardly extending perforate cylindrical side wall, said bottom and side walls joined by a radiused wall portion extending between the tangential juncture thereof with said side wall and the juncture thereof with said bottom wall, said tub adapted to contain the clothes to be washed in the washing fluid contained by said water container, said tub having a central opening in the bottom wall thereof receiving agitate drive shaft means for said agitator and support means for said tub, said agitate drive shaft means mounting said agitator generally vertically in said spin tub, and drive means selectively drivingly connected to said agitate drive shaft means for vertically reciprocating said agitator and to said support means for rotating said spin tub, said agitator during reciprocation thereof providing pulsating currents of washing fluid radially outwardly in said tub along the bottom wall thereof toward said radiused wall portion and upwardly along said radiused wall portion toward said side wall in a manner to induce toroidal flow of washing fluid in said tub, said spin tub during rotation thereof and due to its configuration and the configuration of said stationary water container when containing washing fluid therein producing a pressure gradient wherein washing fluid pressure is highest at the side wall and lowest at the central opening of said spin tub, the invention comprising means for facilitating sediment removal from said tub in cooperation with the radial pulsating currents of washing fluid, said means including said imperforate bottom wall and means for sealing between the opening means in the bottom wall of said tub and said support means therefor to prevent any of the toroidal flow of washing fluid from passing through said bottom wall during rotation of said tub, said radiused wall portion having a single row of equally spaced and coplanar apertures therein around said tub, said single row of apertures being characterized by a location sufficiently radially outward on said radiused wall portion such that there is a velocity vector of washing fluid outwardly through said single row of apertures during reciprocation of the agitator of sufficient magnitude to remove from said tub any sediment removed from the clothes, and said single row of apertures being further characterized in such sufficiently radially outward location due to said pressure gradient that there is an insufficient velocity vector of washing fluid inwardly through said apertures during rotation of said tub to return to said tub any of the sediment removed previously during reciprocation of said agitator.

4,137,736

DOUBLE ACTING AGITATOR WITH CLOTHES LIFTING CAMS

Clark I. Platt, and Howard D. Merchant, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 6, 1977, Ser. No. 839,998
Int. Cl.[2] D06F *13/00, 17/10*
U.S. Cl. 68—134 **7 Claims**



1. A double acting atitator for an automatic washing machine having a vertical axis, the agitator comprising:

an upper agitator element mounted for unidirectional rotation and carrying at least one helical vane thereon to urge clothing and wash fluid downwardly;

a lower agitator element mounted below and coaxially with the upper agitator element and comprising a skirt having a circular peripheral rim and a plurality of radially-extending circumferentially spaced vanes carried on and about said skirt to impel clothing and wash fluid radially outwardly; and

a plurality of crescent-shaped lifting cam members colinearly attached to and extending outwardly and upwardly from said rim of said skirt at an angle to the horizontal, each said cam member being geometrically defined between edge lines forming a portion of the area of a cone, the upper edge of each said cam member providing alter-

nating leading and trailing edge portions to physically deflect and impel clothing upwardly and outwardly upon oscillation,

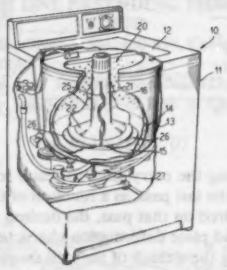
whereby the agitator elements and the cam members impel fabrics into a rollover pattern during operation of the agitator.

4,137,737

ONE-PIECE AGITATOR WITH CLOTHES DIRECTING CAM

William F. Robandt, II, St. Joseph, and Raymond W. Spiegel, Stevensville, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 6, 1977, Ser. No. 840,024
Int. Cl.[2] D06F *13/00, 17/10*
U.S. Cl. 68—134 **6 Claims**



1. An agitator for an automatic clothes washing machine, the agitator comprising:

a unitary, co-axial skirt having a circular outer periphery and a center post extending upwardly therefrom;

an outwardly facing angularly inclined recess formed in said outer periphery;

a plurality of agitator vanes extending generally radially of the center post and upwardly of the skirt; and

a corresponding plurality of lobe-like cams affixed to the periphery of the skirt, wherein

each of said cams is located between a pair of vanes,

the cams form portions of the surface of a cone co-axial with the agitator, and

each said cam has opposite ends each of which terminates closely circumferentially adjacent one of said vanes,

each of said lobe-like cams having an outer edge and an inner edge on said conical surface,

the inner edge of each said cam being co-linear with the circular outer periphery of said skirt and fitting in said recess and each said cam constructed and arranged to be disposed at an inclination angle of from 5° to 15° between an upper surface of the cam and a horizontal line radial of the agitator,

whereby oscillation of the agitator sweeps the vanes and cams through a laundry liquid about the agitator, the vanes urging clothes in the liquid outwardly and the cams urging them upwardly.

4,137,738

TIME LOCK WITH AUTOMATIC RESET

Ulrich Marold, Hinterzarten, Fed. Rep. of Germany, assignor to Theodor Kromer KG Spezialfabrik für Sicherheitsschlösser, Freiburg i.Br., Fed. Rep. of Germany

Filed Jul. 28, 1977, Ser. No. 819,891
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 2634107
Int. Cl.[2] E05B *43/00*
U.S. Cl. 70—274 **24 Claims**

1. A time lock usable with a lock mechanism having a lock part retractable in a path for unlocking a door or the like, said time lock comprising:

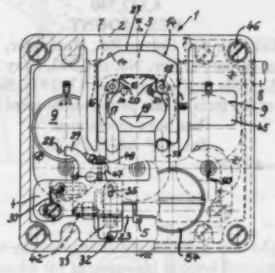
a housing fixed adjacent the path;

a locking member having a recess and displaceable in said housing between a holding position and a freeing position;

means including a clockwork in said housing for displacing said locking member from said holding into said freeing position;

a locking pawl in said housing movable between an engaged position engaged in said recess and a disengaged position clear of said recess;

a keeper mounted in said housing for travel across the path



between a blocking position preventing retraction of the lock part in the path and an unblocking position permitting such retraction; and

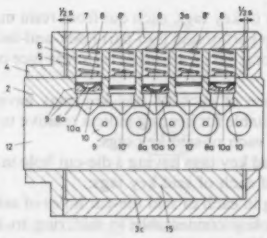
means for linking said keeper and said pawl for travel of said keeper out of said blocking position on displacement of said locking member into said freeing position and for movement of said locking pawl from said engaged into said disengaged position on retraction of the lock part in the path, said linking means having a variable effective length which is lesser in said unblocking than in said blocking position of said keeper.

4,137,739

LOCK CYLINDER FOR A SAFETY LOCK

Ernst Keller, Querstrasse 6, 8805 Richterswil, Switzerland

Filed Aug. 30, 1977, Ser. No. 829,182
Int. Cl.[2] E05B *27/06*
U.S. Cl. 70—358 **9 Claims**



1. In a lock cylinder for a security lock having a cylinder housing and a cylinder plug provided with tumblers made in the form of plug pins and housing pins arranged in rows, the tumblers being aligned by a key which is to be inserted into the lock, each row of housing pins being mounted with associated pin springs in a respective separate chamber, the respective chambers being installed in respective recesses in the cylinder housing, the improvement wherein said cylindrical housing is provided with longitudinal channels, said separate chambers are defined by respective sliders inserted in an axial direction in respective ones of said longitudinal channels of said cylinder housing; and including bores in said cylinder housing, said housing pins being positioned in said bores; spring means positioned between said cylindrical housing and respective ones of

said housing pins, said sliders being mounted with axial play in said longitudinal channels;

at least one plug pin and housing pin pair provided as centering members and which contact one another on their frontal surfaces, a projection in the shape of a section of a cone or sphere being provided on one of said frontal surfaces and a corresponding depression on the other said frontal surface meshing with one another when said cylinder plug is in its locked and open position.

4,137,740

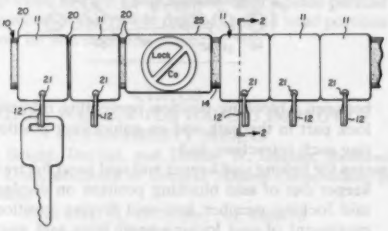
KEY MOUNT

George H. Eckerdt, 948 Culver Rd., Rochester, N.Y. 14609

Continuation-in-part of Ser. No. 690,983, May 26, 1976, Pat. No. 4,072,033. This application Oct. 17, 1977, Ser. No. 842,789 The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.

Int. Cl.[2] A47G *29/10*

U.S. Cl. 70—45 CR **4 Claims**



1. A key mount comprising:

a. a support strip formed of a resin material and having a predetermined length long enough to mount a plurality of keys;

b. said support strip having the hook part of a two-part hook-and-loop pile fastener arranged on a front face of said support strip;

c. a pressure-sensitive adhesive layer on a rear face of said support strp for adhesively securing said support strip on a key mount surface;

d. a manually removable release sheet covering said adhesive layer;

e. a plurality of key tags, each cut from resin material joined to the loop part of said two-part hook-and-loop fastener so that said loop part is arranged on a rear face of each of said key tags;

f. a front face of each of said key tags having a smooth surface suitable for bearing indicia relative to a key associated with each of said key tags;

g. each of said key tags having a die-cut hole in the region of an edge of each of said key tags;

h. a key ring in each of said die-cut holes of said key tags to support a key connectable to said ring to be dependent from said key tag; and

i. said plurality of key tags being releasably attachable to said support strip along the length of said support strip for mounting a plurality of keys and making said front faces of said key tags visible.

4,137,741

WORKPIECE SHAPE CONTROL

Donald J. Fapiano, Salem, and Edward E. Tablett, Troutville, both of Va., assignors to General Electric Company, Salem, Va.

Filed Dec. 22, 1977, Ser. No. 863,110

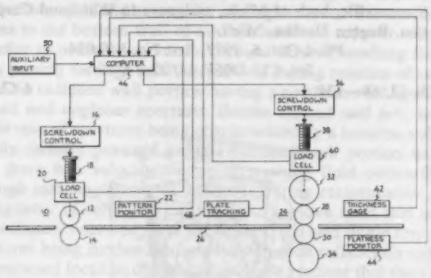
Int. Cl.[2] B21B *37/00*

U.S. Cl. 72—6 **5 Claims**

1. For use in a rolling mill having at least one pair of opposed rolls, a method for controlling the shape of a workpiece based upon a specified final gage and crown comprising the steps of:

(a) establishing a target crown of the workpiece for each rolling pass beginning with the final pass;

(b) determining the roll separating force required to produce a target crown on the workpiece on each pass as a function of the effective roll crown, the modulus of elasticity of the opposed rolls, the diameter of the opposed rolls and the resistance to deformation, width, target crown, delivery gage and entry crown of the workpiece;



(c) determining the entry gage for each rolling pass, beginning with the last pass, as a function of the roll-separating force required on that pass, the desired delivery gage for the pass and plate deformation characteristics;

(d) predicting the stretch of the mill on each rolling pass as a function of the determined roll separating force and workpiece width;

(e) setting the roll openings for each pass as a function of the stretch of the mill and of the desired delivery gage for each pass; and,

(f) passing the workpiece between the rolls following the setting of the roll openings.

4,137,742

INTERSTAND TENSION CONTROL METHOD AND APPARATUS FOR TANDEM ROLLING MILL

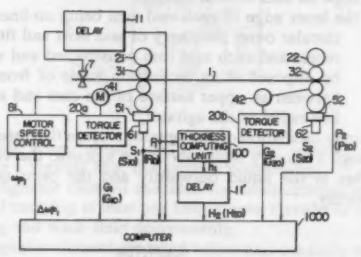
Shinya Tanifuji, and Yasuo Morooka, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 4, 1978, Ser. No. 866,834

Claims priority, application Japan, Jan. 7, 1977, 52-388

Int. Cl.[2] B21B *37/00*

U.S. Cl. 72—6 **30 Claims**



1. In a tandem rolling mill consisting of a plurality of rolling stands, an interstand tension control method including the step of computing the interstand tension on the basis of the detected rolling force and rolling torque, and the step of computing the deviation of said computed interstand tension from the desired value and applying an interstand tension control compensating signal compensating said deviation to interstand tension regulating means thereby maintaining constant the interstand tension imparted to a workpiece being rolled by said tandem rolling mill, said interstand tension computing step comprising:

the first step of computing the reference torque arm value for an i-th rolling stand and storing the same in a memory after the workpiece is fed into the nip between the rolls of said i-th rolling stand but before the workpiece is fed into the nip between the rolls of an (i+1)th rolling stand;

the second step of computing the torque arm value using said reference torque arm value and more than one of the physical quantities including the workpiece thicknesses at the inlet and outlet of said i-th rolling stand, the roll gap of said i-th rolling stand and the rolling force at said i-th rolling stand; and

the third step of computing the interstand tension on the basis of said computed torque arm value and the detected values of the rolling force and rolling torque.

4,137,743

PROCESS AND APPARATUS FOR BENDING TWO TUBES WITH ONE EXTENDING THROUGH THE OTHER

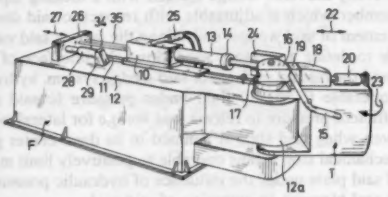
Rigobert Schwarze, Olpener Str. 460-474, Cologne 91, Fed. Rep. of Germany (5000)

Filed Aug. 11, 1977, Ser. No. 823,831

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637454

Int. Cl.² B21D *9/05*

U.S. Cl. 72—150 **16 Claims**



1. In an apparatus for bending a tube assembly, comprising an outer tube and an inner tube inserted radially spaced from the outer tube in the latter, a combination comprising, elongated support means; an arcuate bending die operatively connected to one end of said support means tiltably about a tilting axis between a starting position and a bending position; collet means on said support means displacable in the longitudinal direction of the latter for clamping at least the outer tube and for guiding the tube assembly toward the bending die; clamping means cooperating with the bending die for clamping a portion of the tube assembly against a portion of the bending die in such a manner that the outer surface of the inner tube is only in linear contact with the inner surface of the outer tube at a side of the latter facing said bending die; a cylindrical mandrel of a cross-section substantially equal to the inner surface of the inner tube located in the latter; a sickel-shaped mandrel in the space between the inner surface of the outer tube and the outer surface of the inner tube on the side of the latter facing away from the bending die, said mandrels having leading ends located substantially in a plane normal to the elongation of said support means and including said tilting axis, said mandrels extending from said leading ends toward said support means.

4,137,744

APPARATUS FOR FORMING TURBULATORS

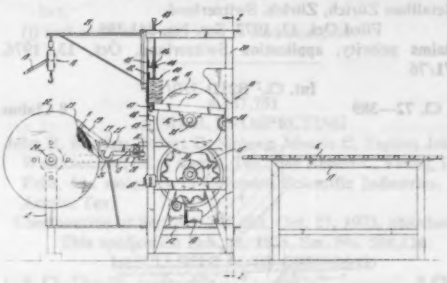
Ronald H. Smick, 745 Chapel St., Ottawa, Ill. 61350

Filed Jul. 7, 1977, Ser. No. 813,676

Int. Cl.² B21H *8/02;* **B21D** *13/10;* **242** *78.6*

U.S. Cl. 72—196 **9 Claims**

1. Apparatus for forming a turbulator from a strip of sheet metal stock comprising, in combination, a frame, first and second forming wheels each having a substantially circular face plate, means for journalling said first forming wheel in said frame for rotation in a plane perpendicular to a predetermined axis, means for journalling said second forming wheel in said frame about a second axis substantially parallel to said first axis, each of said forming wheels having a plurality of outwardly projecting teeth of generally triangular configuration with two legs interconnected by a truncated apex portion, said legs of adjacent triangles being connected by a truncated valley portion and being substantially equally oppositely inclined with



respect to said plane, means for rotating one of said forming wheels, and means for urging said second forming wheel into tooth meshing engagement with said first forming wheel as said sheet metal strip is fed therethrough, said truncated apex and valley portions also being generally triangular in shape and oppositely inclined with respect to said plane such that the pointed portions of said truncated apexes of each roll force the strip metal into said truncated valley portions and against said face plate of said other roll.

4,137,745

DEVICE FOR EXTRUDING HOLLOW ARTICLES

Rustem I. Muratov, ulitsa Vyazemskaya, 1/143, kv. 55; Jury D. Kot, ulitsa Boitsovaya, 24, korpus 3, kv. 35; Mikhail F. Belov, Partizanskaya ulitsa, 47, kv. 26; Melis S. Gildengorn, Orshanskaya ulitsa, 4, kv. 44; Vyacheslav S. Konkov, ulitsa Nedelina, 8, kv. 18, and Mikhail I. Erlikh, ulitsa Tolbukhina, 9, korpus 1, kv. 69, all of Moscow, U.S.S.R.

Filed Mar. 5, 1976, Ser. No. 664,266

Int. Cl.² B21C *23/04, 25/02;* **B21D** *37/04*

U.S. Cl. 72—263 **2 Claims**

1. A device for extruding hollow articles comprising a support; a die holder mounted on said support; a die mounted rotatably in said die holder and having a hole for shaping the external surface of the hollow article, a geometrical axis of said hole of said die being eccentric relative to the geometrical axis of the external surface of said die holder; a needle for shaping the internal surface of the hollow article entering the hole of said die in the course of extrusion; the improvement comprising said die holder being made of an inner bushing and at least one additional bushing with the geometrical axes of the internal surface of said bushings being offset relative to each other and to the geometrical axes of their external surfaces, and one of said bushings being installed in the other so that said bushings can be turned for adjusting the postion of the geometrical axis of said hole of said die relative to the axis of said needle, whereby said die can be positioned either together with rota-

tion of said bushings or with rotation of either one of said bushings so as to ensure minimum wall variations of said hollow articles.

4,137,746

BENDING MATRIX AND LINER

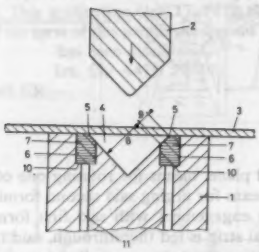
Franz Arnhold, Ottenbach, and Walter Husner, Affoltern am Albis, both of Switzerland, assignors to Ernst Schweizer AG, Metallbau Zürich, Zürich, Switzerland

Filed Oct. 12, 1977, Ser. No. 841,355

Claims priority, application Switzerland, Oct. 13, 1976, 12971/76

Int. Cl.[2] B21D *5/01*

U.S. Cl. 72—389 8 Claims



1. In a bending matrix for the die bending of sheet metal on folding presses, said matrix having a profiled opening, inlet edges to said opening and a base at the bottom of said opening, the improvement comprising:

two longtitudinal grooves in the region of said inlet edges;

a liner consisting of an anti-friction material with a low coefficient of friction, said liner being formed as inserts and being supported in said grooves to form said profiled opening;

openings opening into said longitudinal grooves to permit the insertion of ejection pins into said longitudinal grooves to remove said anti-friction inserts; and

another material capable of absorbing ram pressure for said base.

4,137,747

COLLECTOR FOR BROKEN-OFF FASTENER PARTS

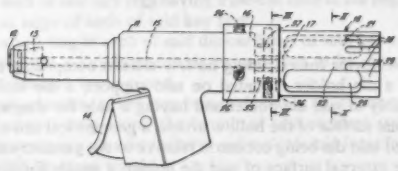
Ronald L. C. Clarke, and Donald S. Savage, both of St. Albans, England, assignors to Aerpat A.G., Zug, Switzerland

Filed Mar. 20, 1978, Ser. No. 888,497

Claims priority, application United Kingdom, Mar. 22, 1977, 12125/77

Int. Cl.[2] B21J *15/34*

U.S. Cl. 72—391 13 Claims



1. A collector for broken-off fastener parts produced by the operation of fastener-installation apparatus, which collector comprises;

a container attachable to or incorporated in the installation apparatus to receive broken-off fastener parts from the installation apparatus;

the container having an aperture;

closure means normally overlying and closing the aperture;

said closure means being temporarily operable, without detaching the closure means, to allow removal or discharge through the aperture of broken-off parts accumulated in the container.

4,137,748

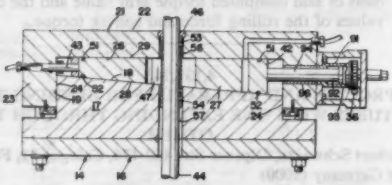
WEDGING STRUCTURE FOR PRESSES OR THE LIKE

Walter J. Grombka, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Filed Sep. 28, 1977, Ser. No. 837,590

Int. Cl.[2] B21J *13/02*

U.S. Cl. 72—448 18 Claims



1. A press or the like comprising a frame providing a die bed, a slide reciprocable in said frame toward and away from said die bed, a wedge system on said die bed operable to adjustably position stationary dies in said press, said wedge system including a laterally movable wedge formed with a locking taper, a plate member which is adjustable with respect to said die bed by movement of said wedge, seals along the face of said wedge operable to define a pressure zone along the interface of said wedge and the mating surfaces of said wedge system, hydraulic means operable to supply fluid under pressure to said zone with sufficient pressure to release said wedge for lateral movement even when said slide is jammed in its dead center position, mechanical stop means operable to positively limit movement of said plate under the influence of hydraulic pressure to prevent seal blowout or extrusion of said seals.

4,137,749

METALWORKING PRESS

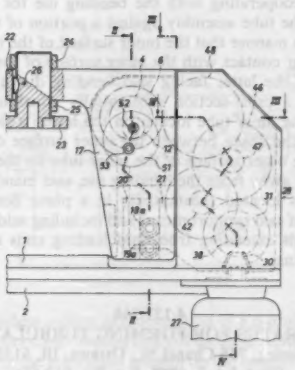
Karl Friedrich, Remshalden-Geradstetten, Fed. Rep. of Germany, assignor to Textima AG, Zurich, Switzerland

Filed Oct. 20, 1977, Ser. No. 844,063

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648143; Aug. 18, 1977, 2737231

Int. Cl.[2] B21J *9/18*

U.S. Cl. 72—449 7 Claims



1. A metalworking press of the type having:

a press housing,

a press ram which can be moved backwards and forwards by means of two planetary gears which have two identical, coaxially arranged, fixed internal gear rims with an exter-

nal gear arranged in each of them with a pitch diameter which is half the pitch circle of the internal gear,

a guide for the press ram provided on the press housing,

a bearing disc connected to the external gear, with bearing axis intersecting the contact point between the two pitch circles, and which is at least indirectly pivotable in the ram, and

a driving gear positioned coaxially to the internal gear rim, wherein the improvement comprises that the driving gear is arranged between the two external gears mounted in pivotable manner in the driving gear and that a bearing for the driving gear is provided on the internal gear rim.

4,137,750

METHOD AND APPARATUS FOR ANALYZING TRACE COMPONENTS USING A GAS CURTAIN

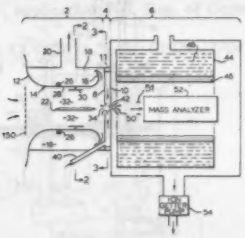
John B. French; Neil M. Reid, both of Thornhill, and Janette A. Buckley, Willowdale, all of Canada, assignors to The Governing Council of the University of Toronto, Toronto, Canada

Continuation-in-part of Ser. No. 555,202, Mar. 3, 1975, Pat. No. 4,023,398. This application Apr. 25, 1977, Ser. No. 790,214

The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.

Int. Cl.[2] G01N *31/00*

U.S. Cl. 73—23 **13 Claims**



7. A method of analyzing trace components in a vacuum chamber, comprising:

(a) selecting a curtain gas of low reactivity with said trace components,

(b) directing said curtain gas into a curtain gas chamber adjacent said vacuum chamber, said curtain gas chamber communicating with said vacuum chamber through an orifice therebetween,

(c) maintaining a vacuum in said vacuum chamber so that said curtain gas in said curtain gas chamber will pass through said orifice into said vacuum chamber and will then expand in said vacuum chamber about the axis of said orifice,

(d) supplying a sample gas at a selected flow to a sample gas region adjacent said curtain gas chamber, said sample gas containing said trace components to be analyzed, said sample gas region communicating with said curtain gas chamber through an opening therebetween, so that some of said sample gas will tend to flow through said opening into said curtain gas chamber and through said orifice into said vacuum chamber,

(e) controlling the flow of said curtain gas to said curtain gas chamber so that such flow is less than the total flow of gas from said curtain gas chamber through said orifice into said vacuum chamber thus to admit a controlled flow of said sample gas from said sample gas region through said opening, through said curtain gas chamber, and through said orifice into said vacuum chamber,

(f) ionizing at least some of said trace components in said sample gas region, thereby forming trace ions in said sample gas region,

(g) creating an electric field in said sample gas region and in said curtain gas chamber to draw said trace ions from said sample gas region through said opening, through said curtain gas chamber, and through said orifice into said vacuum chamber, so that said curtain gas functions as a controllable orifice to control the amount of said sample gas entering said vacuum chamber and also at the same time functions as an ion window to permit ions to pass therethrough under the influence of said electric field,

(i) directing said ions in said vacuum chamber along a path directed away from said expanding curtain gas therein and into an analyzer located in vacuum in said vacuum chamber,

(j) and analyzing said ions in said analyzer.

4,137,751

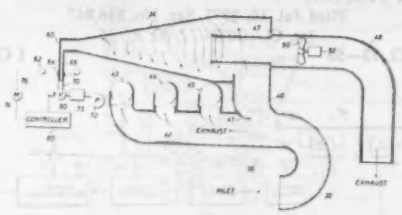
AERIAL PROSPECTING

John R. Rhodes; Robert D. Sieberg; Morris C. Taylor; John C. Westkaemper, all of Austin, Tex., and Robert C. Young, Idaho Falls, Id., assignors to Columbia Scientific Industries, Inc., Austin, Tex.

Continuation of Ser. No. 301,283, Oct. 27, 1972, abandoned. This application Feb. 28, 1975, Ser. No. 554,114

Int. Cl.[2] B01D *46/00*; G01N *31/06*

U.S. Cl. 73—28 **9 Claims**



1. In the method of aerial prospecting involving the airborne collection of mineral particles, analysis of collected particles and correlation of the analysis data to the geographical position of airborne collection, the improved steps of collection comprising:

diverting an inlet stream of particle-laden air from the ambient atmosphere;

dividing the inlet stream into two air streams, one containing the bulk of the particles laden in the inlet stream and the other containing the bulk of the air volume contained in the inlet stream;

passing the air stream containing the bulk of particles into a cyclone separator and depositing the particles upon a collector surface.

4,137,752

LEAK-TESTING METHOD FOR DIAPHRAGM-TYPE ELECTROLYTIC CELLS

William D. Mitchell, Cleveland; John O. Adams, Englewood, and John J. Simmons, Cleveland, all of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 22, 1977, Ser. No. 826,505

Int. Cl.[2] G01M *3/06*

U.S. Cl. 73—45.5 **15 Claims**

1. A method for leak-testing synthetic separators for interleaved planar electrodes, which comprises the steps of:

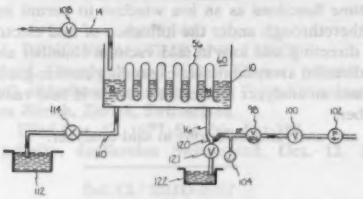
(a) attaching a supportive cell housing to said electrodes;

(b) installing said synthetic separator sealingly about said electrodes so as to create an enclosed chamber within said separator;

(c) pressurizing said chamber to a predetermined pressure with a gas;

(d) slowly filling said housing with a liquid to a level above said separator so as to slowly immerse said separator in said liquid; and

(e) observing said separator while maintaining said predetermined pressure within said chamber so as to determine if



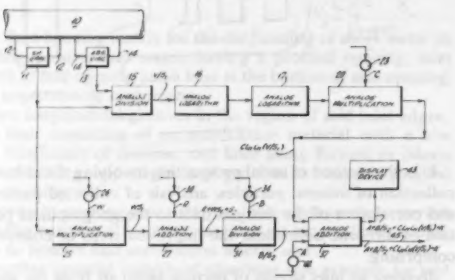
excessive amounts of said gas indicative of a leak are escaping through any portion of said immersed separator.

4,137,753

METHOD AND APPARATUS FOR MONITORING THE PARAFFINICITY CHARACTERIZATION OF HYDROCARBON MIXTURES

Robert A. Woodle, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,847
Int. Cl.[2] G01N *11/00, 33/26*
U.S. Cl. 73—53 **1 Claim**



1. Apparatus for generating a signal representative of the Watson-Nelson characterization factor of a hydrocarbon mixture from a source thereof wherein said mixture is at a temperature in the range of about 100° F. to about 210° F., comprising:

(a) first means operatively coupled with said source of said hydrocarbon mixture for sensing a physical property thereof representative of the absolute viscosity thereof and for providing a first signal representative of said absolute viscosity;

(b) second means operatively coupled with said source of hydrocarbon mixture for sensing a physical property thereof representative of of the specific gravity thereof and for providing a second signal representative of said specific gravity; and

(c) third means operatively coupled with said first and second means for combining said first and second signals to provide a third signal representative of said characterization factor, said combining means including computing means for combining said first and second signals substantially in accordance with the following equation:

$$K = A + B/S_2 + C \ln \ln (V/S_1)$$

where:

K = the Watson-Nelson characterization factor of said hydrocarbon mixture,

V = the absolute viscosity of said hydrocarbon mixture,

S_1 = the specific gravity at the temperature of said hydrocarbon mixture,

S_2 = the specific gravity of said hydrocarbon mixture adjusted to sixty degrees F., and

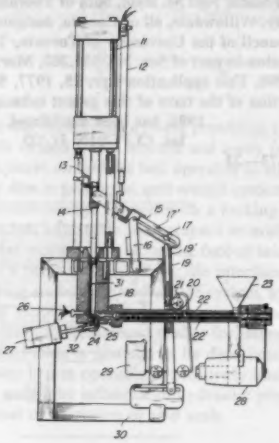
A, B and C are predetermined constants related to the temperature of said hydrocarbon mixture.

4,137,754

MELT RHEOMETER FOR THE MEASUREMENT OF FLOW PROPERTIES OF FOAMABLE PLASTICS AND POLYMER COMPOSITIONS

Edward A. Colombo, Fairport; David E. Johnson, Macedon, and James T. Tsai, Canandaigua, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 598,895, Jul. 24, 1975, abandoned. This application Dec. 8, 1977, Ser. No. 858,574
Int. Cl.[2] G01N *11/08*
U.S. Cl. 73—56 **2 Claims**



2. A method for measuring the flow characteristics of a molten plastic material which comprises advancing solid plastic particles from the feed zone of a rotating screw extruder; melting and mixing said plastic in said extruder; injecting said melted plastic into a heated cylindrical chamber; forcing said molten plastic from said chamber through a capillary die orifice in said chamber while monitoring the flow characteristics of said plastic passing through said capillary die, said method being further characterized by injecting a volatile liquid blowing agent into said extruder in an amount which is proportionate to the amount of molten plastic which is being forced through said chamber through cylinder die orifice.

4,137,755

MATERIAL LAYER VOLUME DETERMINATION

Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405; Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437, and James V. Massey, III, 80 Driftwood La., Trumbull, Conn. 06610

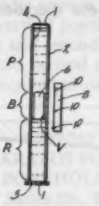
Division of Ser. No. 724,563, Sep. 20, 1976, which is a division of Ser. No. 673,058, Apr. 2, 1976, Pat. No. 4,027,660. This application Dec. 20, 1977, Ser. No. 862,543
Int. Cl.[2] G01N *11/00*
U.S. Cl. 73—61.1 R **4 Claims**

1. A method of determining the approximate volume of a constituent material layer in a material mixture having at least two adjacent material layers of different densities, said method comprising the steps of:

a. putting the material mixture in a tubular container;

b. centrifuging the material mixture so as to layer out the material layers according to specific gravity;

c. elongating the material layer whose volume is to be measured by a factor of at least about four; and



d. measuring the axial extent of the elongated constituent material layer while the mixture remains in the tubular container.

4,137,756
HIGH PRESSURE MEMBRANE TEST CELL

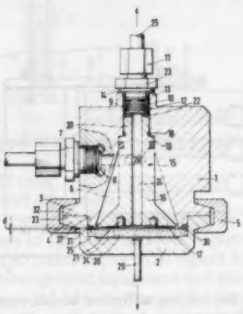
Claus Cosack, Sudstrasse 8; Wolfgang Hein, Hahnestrasse 9, both of Dassel, Fed. Rep. of Germany (3354); Nils Hese, Schulstrasse 8, Einbeck, Fed. Rep. of Germany (3352); Manfred Neumann, Hahnestrasse 7, and Wilhelm Willemer, Burggraben 1, both of Dassel, Fed. Rep. of Germany (3354)

Filed Sep. 14, 1977, Ser. No. 833,089

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717047

Int. Cl.² B01D *25/04*; G01N *13/04*

U.S. Cl. 73—64.3 **8 Claims**



1. A high pressure membrane test cell comprising:

(1) an upper cell part having a central axial hole bearing internal screw threads communicating with an internal pressure chamber with an annular shoulder therebetween and an annular flange surface on its undersurface;

(2) a tangentially aligned medium supply passageway opening into the upper portion of said pressure chamber beneath said axial hole;

(3) a distributor received within said pressure chamber having a cylindrical neck threadably engaged in said axial hole, an internal axial passageway in communication therewith and an annular shoulder engaged against the annular shoulder of said upper part in direct contact therewith to provide a precise axial positioning of said distributor in said chamber;

(4) an externally threaded conduit engaged in said axial hole and extending exteriorly of said cell; said conduit sealable engaged within said hole and against the end of said distributor received in said axial hole; and

(5) a lower cell part detachable secured to said upper cell part and providing support means to position a filter between said pressure chamber and the lower end of said distributor with an annular flange surface abutting said annular flange of said upper cell part in direct contact therewith to provide a precise predetermined distance between the undersurface of said distributor and the upper surface of said membrane.

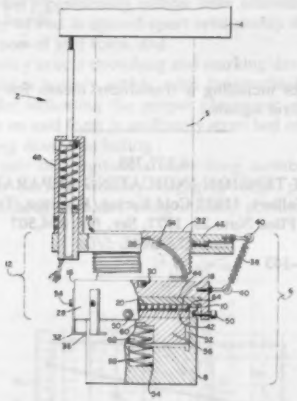
4,137,757
COMPRESSION TESTING APPARATUS

Austin Kovacs, Enfield, N.H., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1978, Ser. No. 874,442

Int. Cl.² G01N *3/08*

U.S. Cl. 73—860 **10 Claims**



1. Testing apparatus comprising an upper platen and a lower platen spaced therefrom, at least one of said platens being movable relative to the other for testing a specimen positioned therebetween, said lower platen comprising

(a) a base having an upper bearing surface;

(b) an upper portion including a first member for contacting said specimen and a second member mating with said first member and having a lower bearing surface, said first and second members being movable relative to each other for pivoting said specimen into alignment between said platens; and

(c) a plurality of balls juxtaposed between and in engagement with said surfaces and serving to support said upper portion for lateral and rotational movement relative to said base to facilitate said alignment.

4,137,758
TORQUE INDICATOR APPARATUS

Arild Rodland, Stavsvei 30 A, Trondheim, Norway (7000)

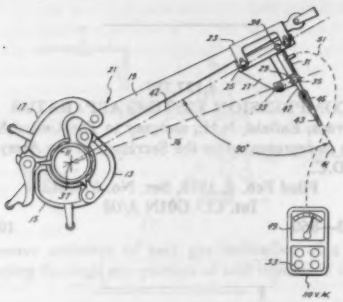
Filed Dec. 29, 1977, Ser. No. 865,493

Int. Cl.² B25B *23/14*

U.S. Cl. 73—139 **17 Claims**

1. Apparatus useful with means for indicating torque applied to a pipe by a tong having an arm, tension force being applied to the arm by a cable, said apparatus comprising: first and second force dividing links pivotally connected together at a first end of each of said force dividing links by pivot means and extending in different directions radially therefrom, said pivot means having means for attachment to the cable to apply the tension force of the cable to said pivot means, said force dividing links having connection means at a second end of each of said force dividing links for transmitting the tension force to

the arm of the tong and for dividing the tension force applied to said pivot means into components, said first of said force



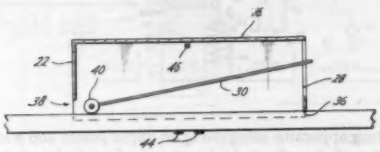
dividing links including a transducer means for converting force to electric signals.

4,137,759

BELT TENSION INDICATING APPARATUS

Wayne M. Talbert, 11432 Cold Spring, Houston, Tex. 77043

Filed Nov. 25, 1977, Ser. No. 854,507
Int. Cl.[2] G01L *5/06*
U.S. Cl. 73—143 14 Claims



1. Apparatus for indicating a change in tension in a belt which comprises:
(a) a roller means;
(b) an indicator needle means connected to said roller and rotated thereby;
(c) housing means which supports said roller for rotation by contact with a belt, said housing means further adapted to be fixedly, temporarily positioned against a belt by a relatively fixed means supported thereby such that elongation of the belt relatively rotates said roller with respect to said housing and said fixed means;
(d) belt straightening means for clamping a belt to straighten such belt; and
(e) means positioning said belt straightening means adjacent to said housing means to position the straightened belt against said roller means and said fixed means.

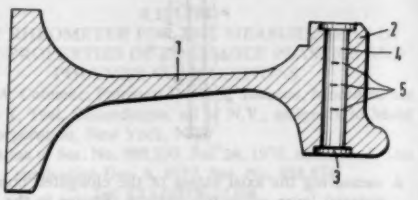
4,137,760

MEASURING WHEEL

Erwin Raquet, Witten, Fed. Rep. of Germany, assignor to Fried. Krupp Hüttenwerke AG, Bochum, Fed. Rep. of Germany

Filed Oct. 19, 1977, Ser. No. 843,536
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1976, 2647505; Feb. 15, 1977, 2706240
Int. Cl.[2] G01L *1/22*; G01B *7/18*
U.S. Cl. 73—146 9 Claims

1. In a measuring wheel for rail vehicles, said measuring wheel having detecting elements in the form of wire resistance strain gauges distributed thereon, to detect vertical forces between said wheel and said rail in a constantly changing wheel contact area therebetween on the running surface of said wheel in an axial direction thereof when in operation, the improvement comprising:
said measuring wheel including a wheel rim having a plurality of recesses extending transversely to the plane of the wheel and being arranged adjacent to one another in a circumferential direction;
said recesses being positioned adjacent to each other to combine to form webs therebetween which run transversely through said wheel rim from one side thereof to the other side thereof, and



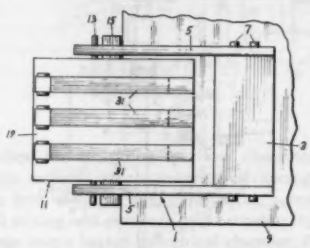
said detecting elements being positioned within said recesses on said webs between the sides of said wheel rim.

4,137,761

TILTING TABLE INITIAL TACK TEST APPARATUS FOR ADHESIVE BONDS

Donald Miller, Rockaway, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 11, 1977, Ser. No. 841,188
Int. Cl.[2] G01N *19/04*
U.S. Cl. 73—150 A 9 Claims



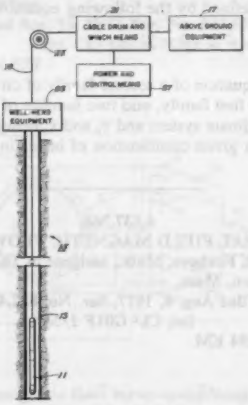
1. Apparatus for testing adhesive bonds comprising:
a bracket including a transverse base and two side legs forming a U-shaped opening, and adapted to be supported substantially in a horizontal plane; a tiltable panel positioned within said opening and pivotally connected at points intermediate the ends thereof to the outer ends of said legs for tilting from a horizontal position to a vertical position; stop means for limiting the tilting of said panel, comprising an elongated block of rectangular cross section attached to the undersides of said bracket legs and abutting said panel in each of the horizontal and vertical positions thereof; a first adherend affixed to said panel; at least one elongated second adherend adhesively bonded at least at one end to a portion of said first adherend that is up in said vertical position; and a weight affixed to said second adherend, for applying a constant gravity load to the adhesive bond between said adherends, in said vertical position.

5. Method of testing adhesive bonds comprising:
supporting a bracket, including a transverse base and two side legs forming a U-shaped opening, substantially in a horizontal plane;
positioning an elongated panel within said opening, initially coplanar with said bracket, and pivotally connecting said panel to said legs for tilting between horizontal and vertical positions:
affixing a first adherend to said panel;

positioning at least one second adherend on said first adherend;
forming an adhesive bond between at least a portion of said second adherend and a portion of said first adherend that will be up in said vertical position of said panel;
attaching a weight to said second adherend;
tilting said panel to said vertical position; and
measuring the time required to rupture said adhesive bond.

4,137,762
WIRELINE APPARATUS FOR USE IN EARTH BOREHOLES

William D. Smith, 4217 Sarita Dr., Forth Worth, Tex. 76109
Filed Mar. 2, 1977, Ser. No. 773,390
Int. Cl.[2] E21B 47/12
U.S. Cl. 73—151 8 Claims

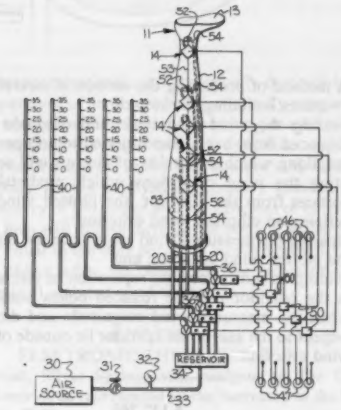


1. Wireline apparatus for use in earth boreholes, said apparatus comprising:
a. a downhole tool;
b. above-ground equipment;
c. a wireline connected to said tool and via cable drum and winch means to said above-ground equipment; said wireline serving to transmit electrical signals between said tool and said above-ground equipment and also to support said tool in suspended fashion from said drum in a borehole;
d. means to power and control said cable drum and winch means so as to raise or lower said tool in said borehole;
e. said wireline comprising one or more insulated inner conductors contained within a continuous length of smooth walled metal tubing made of a material the tensile strength of which has been raised by the swaging of said tubing to force its inner wall into intimate contact with said insulated conductor or conductors such that it or they are supported by said tubing and consequently can be of length greater than could be supported by said conductor or conductors alone; said tubing after swaging having a tensile strength above that of mild steel and a yield strength to weight ratio of at least 15 to 1.

4,137,763
HOSIERY TESTING APPARATUS

Roger T. Swallow, Asheboro, N.C., assignor to Rampon Products, Incorporated, Asheboro, N.C.
Filed Jun. 21, 1978, Ser. No. 917,544
Int. Cl.[2] G01L 5/04
U.S. Cl. 73—159 10 Claims

1. An apparatus for accurately measuring and comparing the relative compressive forces of longitudinally spaced portions of stretchable hosiery articles, said apparatus comprising the combination of
(a) a form including integral leg and foot portions and adapted to support a hosiery article in stretched condition thereon, said leg portion being circular in cross-section throughout its length with successive segments of the length of said leg portion increasing in circular diameter from said foot portion and throughout the length of said leg portion, and including
(1) sensor devices supported on and in spaced positions longitudinally of said leg portion for determining the amount of pressure applied against said leg form in each of said positions by the hosiery article stretched thereon,
(2) pressure indicating means operatively connected to each of said sensor devices and being operable to indicate the amount of pressure applied to each of said sensor devices by the hosiery article, and
(3) hosiery positioning indicia lines extending longitudinally of and in spaced-apart relationship along said leg portion of said form, and
(b) a hosiery article stretching and marking device for use in marking a hosiery article with longitudinally extending lines for indicating the proper placement of the hosiery article on said form in uniformly stretched condition, said marking device including
(1) a pair of longitudinal stretching members provided with narrow hosiery engaging edge portions, said stretching members being initially positioned in a first



spaced-apart position to receive the hosiery article in unstretched condition thereon, and
(2) means for moving said longitudinal stretching members apart to a second spaced-apart position to uniformly stretch the areas of the hosiery article extending between said narrow hosiery engaging edge portions of said pair of stretching members and to support the stretched hosiery article thereon and in condition to be marked with longitudinal lines corresponding with said narrow hosiery engaging edge portions and indicating the equal halves of the stretched hosiery article,
(3) a third longitudinal stretching member initially positioned in alignment between said pair of longitudinal stretching members when positioned in said first spaced-apart position, and
(4) means for moving said third longitudinal stretching member to a position midway between and outwardly of alignment with said pair of longitudinal stretching members to equally divide and uniformly stretch the half of the hosiery article extending between said narrow hosiery engaging edge portions of said pair of stretching members and in condition to be marked with a longitudinal line corresponding with said third longitudinal stretching member and indicating the equal division of adjacent quadrants of the hosiery article, the

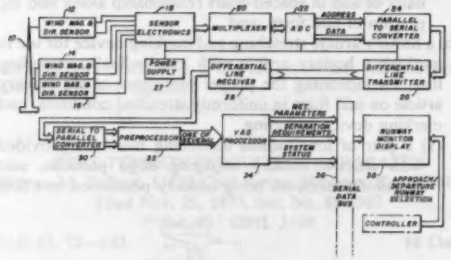
longitudinal lines on the hosiery article providing guide lines for placing the hosiery article in the properly stretched condition with the marked lines on the hosiery article aligned with said indicia lines on the hosiery form.

4,137,764

VORTEX ADVISORY SYSTEM

James N. Hallock, Waltham; Edward A. Spitzer, Natick, and William D. Wood, Sudbury, all of Mass., assignors to The United States of America as represented by the Secretary of Transportation, Washington, D.C.

Filed Sep. 15, 1977, Ser. No. 833,501
Int. Cl.[2] G01W 1/02
U.S. Cl. 73—178 T **12 Claims**



1. A method of predicting the motion of aircraft generated wake vortices including the step of:

measuring the wind magnitude and direction at a point displaced from but juxtapositioned to an operating corridor along which a plurality of aircraft will serially pass;

plotting the wind conditions which predictably remove vortices from the corridor, the plotted wind conditions defining an elliptical wind criterion:

comparing the measured wind magnitude and direction with the plotted wind criterion; and

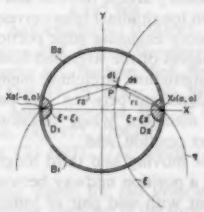
providing an indication that separation of aircraft traveling in the corridor may be reduced below standard values when the measured wind magnitude and direction with respect to the axis of the corridor lie outside of the plotted wind criterion.

4,137,765

ELECTROMAGNETIC FLUID FLOWMETER INSENSITIVE TO FLOW VELOCITY DISTRIBUTION

Shigetada Matsushita, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed May 24, 1977, Ser. No. 800,138
Claims priority, application Japan, May 25, 1976, 51-60304
Int. Cl.[2] G01F 1/58
U.S. Cl. 73—194 EM **3 Claims**



1. An electromagnetic fluid flowmeter of the type comprising a pair of electrodes horizontally disposed opposite each other on the internal periphery of a tubular fluid conduit, means for establishing a magnetic field within the conduit the intensity of which in a given direction is a function of its position (x,y) in a cross-sectional plane of the conduit, and detecting means having a high input resistance connected to the electrodes for detecting the voltage generated therebetween as a conductive liquid flows through the conduit, the improvement comprising a pair of concave electrically insulating members vertically disposed opposite each other on the internal periphery of the conduit and individually interposed between the respective electrodes, the arcs of the inner surfaces of the insulating members being defined by the following equation:

$$(y+y_o)^2 + x^2 = a^2 + y_o^2$$

which is the equation of a first family of circles through two poles (—a,0) and (a,0) in the rectangular coordinate system superimposed on said cross-sectional plane of the conduit with the center of the conduit located at the origin of the rectangular coordinate system, and wherein said electrodes have a convex arc shape, the arcs of the outer surfaces of said electrodes being defined by the following equation:

$$y^2 + (x-x_o)^2 = x_o^2 - a^2$$

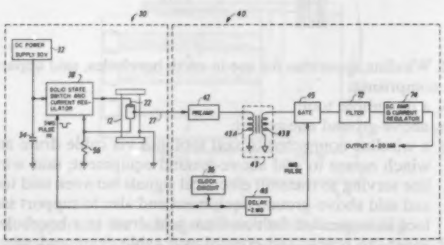
which is the equation of a second family of circles orthogonal to those of the first family, said two families of circles defining a bipolar coordinate system and y_o and x_o being predetermined constants for a given combination of insulating members and electrodes.

4,137,766

INTEGRAL FIELD MAGNETIC FLOWMETER

Neil E. Handel, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Aug. 8, 1977, Ser. No. 822,473
Int. Cl.[2] G01F 1/58
U.S. Cl. 73—194 EM **22 Claims**



1. A magnetic flowmeter comprising:

a conduit for carrying a flowing fluid having an electrically conductive portion;

a field coil having a portion extending substantially along the longitudinal axis of said flow conduit within said conductive portion for producing a concentric magnetic field generally perpendicular to said longitudinal axis;

an inner electrode around said longitudinal coil portion and extending longitudinally of said flow conduit conductive portion near said coil portion; and

means for insulating said inner electrode from said conductive portion, whereby said conductive portion serves as a large surface-area electrode.

17. A magnetic flowmeter for measuring the velocity of a flowing fluid comprising:

a first electrode;

a second electrode;

a field coil for producing a magnetic field generally perpendicular to the flow;

means for delivering a current pulse through said field coil causing said magnetic field to vary between a steady-state on condition and an off condition;

said flowing fluid interacting with said varying magnetic field to produce a voltage across said first and second electrodes when said magnetic field is on that includes

two components, a pulsed signal proportional to flow rate superimposed on a d-c signal substantially equal to the galvanic potential formed at said electrodes;

detection circuitry having an input and an output and receiving at said input said voltage in synchronism with said current pulse means;

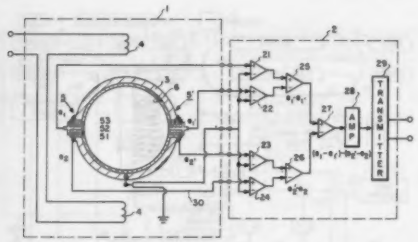
said detection circuitry including a transformer arranged to pass to said output said pulsed signal proportional to flow rate while blocking substantially all of said galvanic potential, said transformer also providing isolation between the ground reference of said electrodes and that of said output.

4,137,767

ELECTROMAGNETIC FLOW METER

Norikazu Wada, Ichihara, Japan, assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Sep. 13, 1977, Ser. No. 832,873
Int. Cl.² G01F *1/58*
U.S. Cl. 73—194 EM **8 Claims**



1. An electromagnetic flow meter comprising

electrodes opposingly disposed on the wall of a pipe for guiding fluid including a plurality of concentric electrode assemblies each having a plurality of electrodes arranged coaxially, and

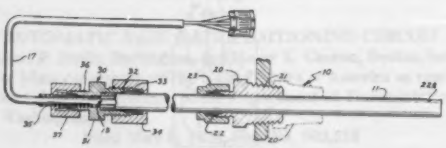
differential amplifier means for flow signal values detected by respective facing pairs of electrodes of said opposing concentric electrode assemblies operative that the values amplified once are successively and differentially amplified further, whereby the flow representative value attained in the final differential amplification is an integral multiple of the voltage difference between said respective pairs of electrodes.

4,137,768

ADJUSTABLE DEPTH THERMOWELL

David R. Tushie, and Douglas C. Myhre, both of Eden Prairie, Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Mar. 28, 1978, Ser. No. 890,997
Int. Cl.² G01K *1/08*
U.S. Cl. 73—343 R **10 Claims**



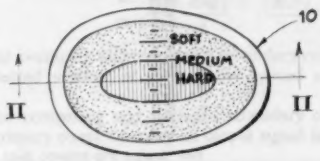
10. The method of adjusting the amount of protrusion of a thermowell outwardly beyond a support wall wherein said thermowell includes an outer sheath having an open end extending outwardly from the support wall, a sensor assembly removably mounted in said outer sheath and including a lead cable extending outward from the open end of said sheath, comprising the steps of providing adjustable support means to mount said sheath to the wall and adjusting the thermowell to a desired position, removing the sensor assembly from the sheath, removing excess portions of said sheath, and providing a second compression fitting including a first portion that releasably seals against the outer surface of said sheath adjacent said open end, and a second portion which extends beyond said open end and includes means to seal the opening of said sheath, and tightening said second compression fitting over the open end of the sheath after the excess portions of the sheath have been removed and the sensor assembly is remounted within said sheath.

4,137,769

METHOD AND APPARATUS FOR DETERMINING INTERNAL TEMPERATURE OF AN OBJECT

Robert Parker, 411 Rolling Hills La., Alamo, Calif. 94507

Filed Feb. 6, 1978, Ser. No. 875,434
Int. Cl.² G01K *11/12*
U.S. Cl. 73—356 **14 Claims**



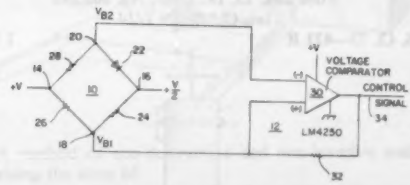
1. A time-temperature indicator for visually determining the internal temperature of an object being externally exposed to a temperature change, said indicator comprising a solid body of transparent material having visible temperature indicating means incorporated therein in thermal contact with said solid body, said body having a physical geometry simulating the physical geometry of the object and a coefficient of conductivity such that heat will diffuse through the body in a time period substantially equal to the time period in which heat will diffuse through the object when the object and the indicator are exposed to identical ambient conditions.

4,137,770

ELECTRONIC THERMOSTAT

Philip A. Trout, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1977, Ser. No. 858,779
Int. Cl.² G01K *7/14*
U.S. Cl. 73—362 AR **4 Claims**



1. An electronic thermostat for providing a digital control signal whenever the temperature rises above a first threshold level and for removing said control signal whenever the temperature drops below a second threshold level comprising:

a temperature sensing bridge circuit having a forward biased silicon junction diode as one of its element and having two output ports;

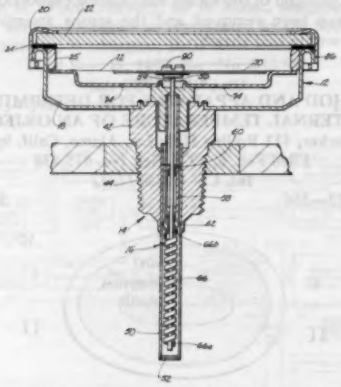
a voltage comparator circuit having input ports coupled to said bridge output ports and having an output port; and

a positive feedback path from said voltage comparator circuit to an input of said voltage comparator circuit for latching said control signal.

4,137,771
REPLACEABLE SENSING AND INDICATING ELEMENT FOR A BI-METALLIC THERMOMETER

Dan B. Young, Cincinnati, and Benjamin L. Binford, Pleasant Plain, both of Ohio, assignors to Palmer Instruments, Inc., Cincinnati, Ohio

Filed Mar. 18, 1977, Ser. No. 779,190
Int. Cl.² G01K *5/68*
U.S. Cl. 73—363.9 **4 Claims**

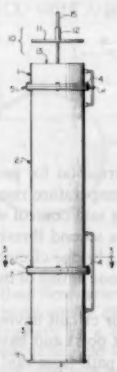


1. In a bi-metallic thermometer of the type having an enclosure secured to support means for mounting said thermometer in an operating environment, the improvement in combination therewith comprising, a replaceable sensing and indicating element for sensing temperatures, said element being selectively movable and providing a visual indication of the temperature of said operating environment, said element being easily removable from and replaceable in said enclosure, said element comprising a stem terminating in a bi-metal helical temperature sensing coil rotatable with changes in temperature, a shaft extending from said coil and disposed within said stem for transmitting the rotary motion of said coil, an indicating pointer secured to said shaft, and a calibrated scale affixed to said stem and adjacent with said pointer for providing a visual indication of said temperature, and restraining means coacting with said element to maintain said element in said enclosure.

4,137,772
AUTOMATED MEANS FOR HIGH VOLUME, DISCRETE DEPTH PLANKTON COLLECTING

Robert K. Hitch, 1769 Willard St. NW., Washington, D.C. 20009

Filed Jun. 13, 1977, Ser. No. 805,593
Int. Cl.² G01N *1/14*
U.S. Cl. 73—421 R **1 Claim**

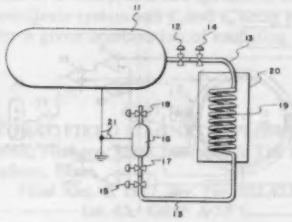


1. A plankton collector for filtering plankton from water comprising: a hollow cylinder open at both ends providing an intake and outlet end, a motor driven propeller and a net mounted within said cylinder whereby plankton is filtered by said net upon rotation of said propeller; a closing means having a planar shape including a circular periphery and a diameter greater than the inside diameter of said intake end, said closing means including a hollow cylinder attached to a central hole in said closing means, said hollow cylinder attached to said closing means slidingly surrounds a tether, said tether being attached to said intake end and extending centrally therefrom such that upon completion of a collecting period, said closing means is slid along said tether thereby closing said intake end.

4,137,773
ANTI-ELECTROSTATIC SAMPLING METHOD

Rado G. Loncaric, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 9, 1977, Ser. No. 858,991
Int. Cl.² G01N *1/10*
U.S. Cl. 73—421 B **4 Claims**

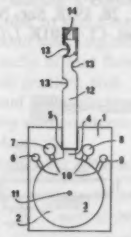


1. A method of taking liquid samples from petroleum handling equipment comprising flowing a liquid sample through a sample line at a rate of less than 1 meter per second, said sample line communicating with said equipment and with a sample container; cooling said liquid in at least a portion of said sample line, said portion between said equipment and said container, and flowing said liquid sample into a low point of said container so that said liquid sample flows upwardly in said container.

4,137,774
SAMPLING MOULD

Lars A. T. Kumbrant, Box 23, S-190 63 Orsundsbro, Enköping, Sweden

Filed Mar. 30, 1977, Ser. No. 783,039
Claims priority, application Sweden, Apr. 1, 1976, 7603909
Int. Cl.² G01N *1/12*; B28B *7/34*
U.S. Cl. 73—425.4 R **6 Claims**



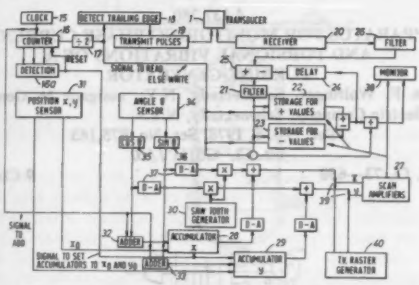
1. A sampling mould for drawing samples of molten material from pools of molten materials, said mould comprising two blocks located and fastened to each other, at least one of which is provided with a recess which forms a specimen, an entrance passage which permits said molten material to flow into said recess, said passage extending from one end of at least one of said blocks and into said recess, said passage being narrower in

width at said recess than at said one end and being provided with a shoulder where said width is changed, a glass tube which extends into said entrance passage and rests upon said shoulder, said tube comprising a plurality of radial dents, and a plurality of disc-shaped cavities, positioned on each side of said passage, each of which forms a hollow in which a disc-shaped sample of a fixed size is formed, each of said disc-shaped cavities being connected to said recess through a narrow channel in which an elongated handle is formed connecting said respective sample with said specimen and by means of which said respective sample may be easily detached from said specimen.

4,137,775
ULTRASONIC APPARATUS

Christopher A. G. LeMay, Osterley, England, assignor to Emi Limited, Middlesex, England

Filed Sep. 27, 1976, Ser. No. 727,128
Claims priority, application United Kingdom, Oct. 2, 1975, 40283/75; Aug. 4, 1976, 32434/76; Sep. 15, 1976, 38155/76
Int. Cl.² G01N *29/04*
U.S. Cl. 73—602 **20 Claims**



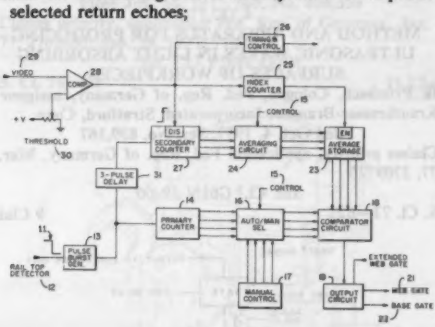
1. An apparatus, for examining a body by means of ultrasonic energy, including: ultrasonic transducer means, comprising at least one transmitting transducer, arranged to direct ultrasonic energy through a region of the body along a plurality of bean paths at different orientations therein; at least one receiving transducer, which may also be the transmitting transducer, arranged to receive ultrasonic energy reflected from locations within the body to provide, for each of said beam paths, a set of output signals representing line integrals of reflection of said energy towards said receiving transducer for respective lines of reflecting locations transverse to the direction of propagation of the energy; and processing means for providing a representation of the distribution of reflection coefficients in said region, the processing means including a data store representing said region and having a matrix of addresses, one for each of a plurality of elements of the body in said region, and means for distributing to the addresses, corresponding to elements intersected by each line of reflecting locations, a value related to the output signal for the respective line together with contributions derived from other output signals of the same set.

4,137,776
AUTOMATIC BASE GATE POSITIONING CIRCUIT

Robert P. Rudis, Burlington, and Harry L. Ceccon, Boston, both of Mass., assignors to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed May 8, 1978, Ser. No. 903,518
Int. Cl.² G01N *29/00*
U.S. Cl. 73—611 **4 Claims**

1. An automatic base gate positioning circuit in combination with a sonic rail flaw detection system comprising:
- a controllable pulse burst generator for producing a string of uniform pulses spaced a prearranged interval from a sonic input to straddle a range of echoes corresponding to known rail thickness variations;
- first pulse counter means for counting said string of pulses;
- pulse delay means for simultaneously and separately delaying said string of pulses;
- second pulse counter means for counting said delayed string of pulses a preset number of pulses behind said first counter means;
- means for terminating said secondary count in response to selected return echoes;

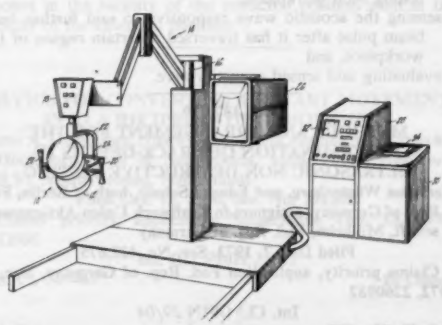


- means for averaging said terminated secondary count over a preselected number of controllably spaced sonic flaw tests;
- means for comparing said averaged secondary count with said primary count whereby an output signal is triggered when said counts are equal; and
- gate means for receiving said trigger whereby an output gate is positioned to align with displayed echoes from said sonic detection systems.

4,137,777
ULTRASONIC BODY SCANNER AND METHOD

Ronald A. Haverl, Andover, and Milton Stoller, West Hartford, both of Conn., assignors to Mediscan Inc., South Windsor, Conn.

Filed Jul. 11, 1977, Ser. No. 814,477
Int. Cl.² G01N *29/04*
U.S. Cl. 73—620 **36 Claims**



1. A method of non-destructive and non-invasive testing comprising the steps of:
- energizing an ultrasound transducer in such a manner as to cause an intermittent beam of ultrasonic energy having a preselected focal length to be generated;
- directing the generated ultrasonic energy beam to an object to be tested, the focal point of the beam being within the object;
- scanning the beam at a first rate of speed so as to move the beam focus point along a line whereby a sector of the object is tested;
- receiving echoes from the boundries of regions within the object which are characterized by different impedances to the passage of ultrasonic energy;
- displaying the received echoes;
- rescanning the beam along the line at a second rate of speed

which is slower than said first rate of speed when an area of interest within the object is observed from the displayed echoes; and

refocusing the beam to a plurality of different focal lengths during the rescanning thereof.

4,137,778

METHOD AND APPARATUS FOR PRODUCING ULTRASONIC WAVES IN LIGHT ABSORBING SURFACES OF WORKPIECES

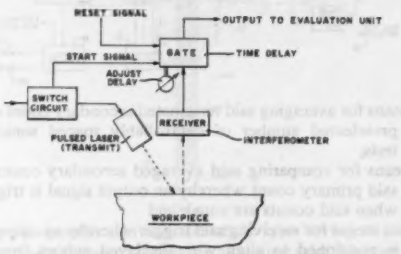
Erik Primbsch, Cologne, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Oct. 4, 1977, Ser. No. 839,167

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709725

Int. Cl.[2] G01N *29/00*

U.S. Cl. 73—627 **9 Claims**



1. Method for testing a workpiece by the acoustic wave test method using pulsed laser beam energy for producing an acoustic wave in the workpiece comprising:

transmitting to the workpiece surface portion at which an acoustic wave is to be produced a plurality of laser beam pulses for removing contamination present at said workpiece surface portion;

transmitting thereafter at least one further laser beam pulse to the same portion, the resulting acoustic wave propagated in the workpiece being used for nondestructively testing such workpiece;

sensing the acoustic wave responsive to said further laser beam pulse after it has traversed a certain region of the workpiece, and

evaluating said sensed acoustic wave.

4,137,779

METHODS AND ARRANGEMENT FOR THE DETERMINATION OF CRACK-DEPTHS IN ULTRASONIC NON DESTRUCTIVE TESTING

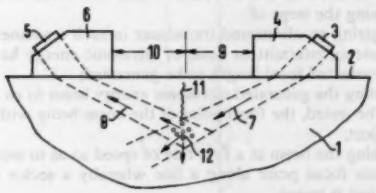
Hermann Wüstenberg, and Eduard Schulz, both of Berlin, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Reg. of Germany

Filed Dec. 7, 1973, Ser. No. 422,875

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1972, 2260932

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—627 **4 Claims**



1. A method of determining depth propagation of a defect in a body by ultrasonic materials testing wherein a first angle probe having an ultrasonic wave transmitting oscillator produces a scatter signal at structural inhomogeneities of a body formed with a defect and the scatter signal is received by an ultrasonic wave receiving oscillator of a second angle probe, which comprises: transmitting an ultrasonic wave at a first angle along a first line in direction towards the defect so that the scatter signal there at is shadowed by the defect and diminished in intensity; receiving the diminished signal from the defect at a second angle in a direction along a second line intersecting with the first line at the defect, transmitting additional ultrasonic waves and receiving diminished scatter signals along respective lines intersecting at the defect at varying depths of the body and ascertaining the depth propagation of the defect by a marked increase in intensity of the received signal when the intersection of the respective lines along which the ultrasonic wave is transmitted and the scatter signal is received reach beyond the innermost limit of the defect.

4,137,780

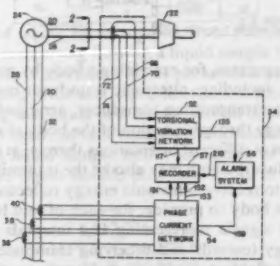
APPARATUS FOR MONITORING PHASE CURRENTS AND TORSIONAL VIBRATIONS OF A TURBINE-GENERATOR

John F. Wolfinger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 6, 1978, Ser. No. 875,163

Int. Cl.[2] G01H *1/10*

U.S. Cl. 73—650 **9 Claims**



1. A system for monitoring phase currents and torsional vibrations of a three-phase turbine-generator comprising:

a phase current network operable to produce three phase current signals in response to the three line currents of said turbine-generator and to determine a composite current signal from preselected harmonics of said phase current signals;

a plurality of probes locatable adjacent a shaft of said turbine-generator for sensing the rate of rotation of said shaft and providing a plurality of electrical signals which include true components representing torsional vibrations of said shaft and which may include false components at frequencies that are multiples of the rate of rotation of said shaft;

a torsional vibration network operable to combine said electrical signals to produce a first vibration signal containing only true components of torsional vibrations of said shaft and a second vibration signal derived from said first vibration signal and components thereof;

an alarm system adapted to compare said composite current signal with a first reference level and to compare said second vibration signal with a second reference level and to generate an alarm signal if at least one of said reference levels is exceeded; and

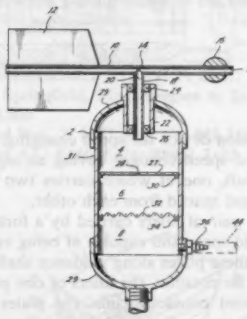
a recorder operable in response to said alarm signal to record said first vibration signal and said phase current signals.

4,137,781

DEVICE FOR MEASURING THE STATIC PRESSURE OF A MOVING FLUID

John R. Andrus, Missouri City, Tex., assignor to Waukesha-Pearce Industries, Inc., Houston, Tex.

Filed Nov. 4, 1977, Ser. No. 848,551
Int. Cl.[2] G01L 7/00; G01W 1/02
U.S. Cl. 73—707 2 Claims



1. A device for measuring the static pressure of a moving fluid comprising:

(a) a housing including therein a first chamber, a second chamber in communication through a wall with said first chamber and a third chamber in communication with said second chamber;

(b) an enclosed hollow elongated member exposed to the moving fluid, having one or more fins in proximity to one end of said elongated member projecting radially outwardly therefrom thereby tending to align the longitudinal axis of the elongated member parallel to the direction of movement of said fluid;

(c) a fluid inlet disposed in the elongated member normal to the longitudinal axis thereof and communicating the interior of said elongated member to the moving fluid;

(d) a hollow shaft, one end of which is journalled to the housing, and the other end of which is secured normally to the elongated member communicating the fluid inlet port with the first chamber of the housing so that the moving fluid can communicate with the said first chamber;

(e) an aperture in the wall between the first and second chambers, said aperture having a small cross-sectional area in comparison to the area of said wall thereby communicating the fluid in the first chamber to the second chamber such that fluid movement from the first chamber to the second chamber is substantially damped;

(f) an acoustical baffle means communicating the fluid of the second chamber with the third chamber such that the fluid flow from the second chamber into the third chamber is further damped and the fluid in the third chamber becomes substantially static;

(g) a pressure gauge; and

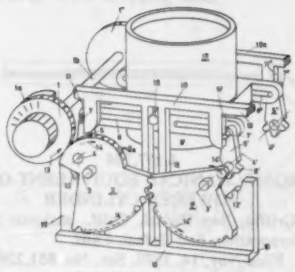
(h) a hose communicating the static fluid of the third chamber to the pressure gauge.

4,137,782

APPARATUS FOR RETRACTING AND EXTENDING OF A LENS HOLDER OF A CAMERA

Karl-Heinz Lange, Bünde, Federal Rep. of Germany, assignor to Balde Werke GmbH & Co. KG, Fed. Rep. of Germany

Filed Jun. 14, 1977, Ser. No. 806,359
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703667; Jan. 29, 1977, 7702533
Int. Cl.[2] F16H 19/04
U.S. Cl. 74—32 11 Claims



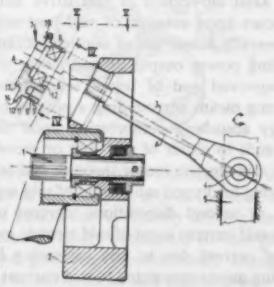
1. Apparatus for the retracting and extending the lens holder of a camera, which comprises two gear means swingably supported about fixed axes on different sides of the longitudinal central plane of the lens holder, said gear means each comprising at least a segment of a gear-wheel, said gear means being operatively associated with each other, two stationary toothed members, two swingable segments coupling said lens holder and said gear means and having toothing operable to intermesh with stationary toothing, said gear means, when swung, being operable to retract and extend said lens holder via said swingable segments and to move said swingable segments over the stationary toothed members as said lens holder is extended from its fully retracted position, such that with equal paths of swing of the gear means, the lens holder is displaced by a larger amount in the vicinity of the retracted position than in the vicinity of the extended position.

4,137,783

DEVICE FOR CONVERTING A ROTARY MOVEMENT INTO A RECIPROCATORY MOVEMENT

Pieter A. Oosterling, Nieuw-Vennep, and Antoine M. R. Baecke, Hoofddorp, both of Netherlands, assignors to Multinorm B.V., Nieuw-Vennep, Netherlands

Filed Oct. 12, 1976, Ser. No. 731,838
Claims priority, application Netherlands, Oct. 13, 1975, 7512030
Int. Cl.[2] F16H 21/42
U.S. Cl. 74—47 16 Claims



1. A device for converting a rotary movement into an oscillating movement comprising a rotatable driving shaft, a fly-

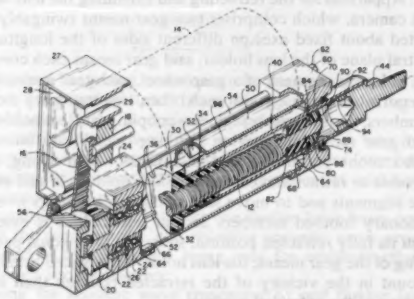
wheel rigidly secured thereto, an oscillatorily driven body oscillating about an axis crossing the axis of the driving shaft and a coupling element pivoted to said body and journalled eccentrically in the fly-wheel, the bearing of the coupling element in the fly-wheel being displaceably arranged for varying the eccentricity and hence the amplitude of the oscillatory movement, and the fly-wheel bearing of the coupling element being eccentrically accommodated in a supporting member, which can be disposed in more than one angular position in the fly-wheel.

4,137,784

ELECTROMECHANICAL EQUIVALENT OF FLUID POWERED CYLINDER

James A. Griffin, San Rafael, Calif., assignor to Industrial Device Corporation, San Rafael, Calif.

Filed Nov. 14, 1977, Ser. No. 851,229
Int. Cl.[2] F16D *3/26*
U.S. Cl. 74—89.15 **9 Claims**



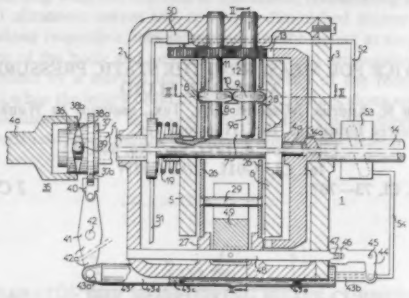
1. In an electromechanical actuator for taking the rotational motion of an electric motor and varying the spacing between two actuator ends from a first close disposition to a second spaced disposition; said actuator including an electric motor having a current input and rotating power output; a rotating and threaded lead screw attached for rotation with respect to one of said actuator ends; a drive nut having threads complementary to said lead screw; means for linking said drive-nut to the other of said actuator ends; a casing having said electric motor mounted thereto; means within said casing for preventing relative rotation between said casing and said drive nut, whereby axial movement of said drive nut along said lead screw occurs upon rotation of said lead screw; transmission means generally at one end of said lead screw for transmitting said rotating power output of said motor to rotate said lead screw; improved end of travel sensing means comprising: single spring means surrounding a portion of said lead screw for energy absorbing compression upon movement of said actuator ends to either of said first or second dispositions to impart to said electric motor through said transmission means an increasing load upon movement of said actuator to either of said first or second dispositions; current sensing means attached to said current input of said electric motor for detecting change of current due to said increasing load; and current interrupting means connected to said current input and responsively communicated to said current sensing means for interrupting said current upon said increase in current due to said increase in load, said end of travel sensing means being devoid of limit switches inside said casing.

4,137,785

SPEED TRANSMISSION DEVICES

Jean-Claude Virlon, 15 rue de la Croix Blanche, Collegien, France (77400)

Filed Oct. 6, 1976, Ser. No. 730,127
Claims priority, application Luxembourg, Oct. 7, 1975, 73541
Int. Cl.[2] F16H *15/08*
U.S. Cl. 74—194 **17 Claims**



1. Transmission device for speed changing, comprising
a mechanical speed changer having an input shaft and an output shaft, one of which carries two plates fixed for rotation and spaced from each other,
at least one pair of idlers carried by a fork and positioned within said space and capable of being radially displaced between these plates along guidance shafts to which they are fixed for rotation, the idlers of one pair bearing with rolling point contact against the plates subjected to a pressure force tending to push them against the idlers,
a control device connected to the transmission by at least one couple regulator enabling modification of the radial position of the said pair of idlers,
the idlers of one pair being mounted with freedom for oscillation each relative to its own guidance shaft about the perpendicular passing through the contact points between idlers and plates, the system being characterized in that the connection between the idlers and the guidance shafts is provided by entrainment members arranged on the one hand to be axially displaced along the said shafts, on the other hand to fix for rotation the idlers and the shafts, again on the other hand to enable the oscillatory deflection of the idlers about the said perpendicular passing through the contact points between idlers and plates.

4,137,786

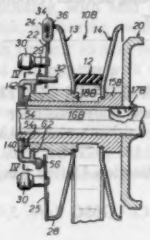
SPEED CHANGE DEVICE

Jean-Claud Fénart, Fourqueux, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Apr. 5, 1977, Ser. No. 784,719
Claims priority, application France, Apr. 15, 1976, 76 11163
Int. Cl.[2] F16H *55/52, 55/56*
U.S. Cl. 74—230.17 E **21 Claims**

1. A speed change device comprising first and second pulleys and an endless drive belt engaged around said pulleys, said pulleys each having a fixed side and a movable side shiftable axially relative to its fixed side in accordance with the rotational speed thereof, said side plates having inclined side surfaces defining a belt receiving groove, one of said pulleys having a first abutment member for defining the limit of axial separation of its movable side relative to its fixed side in the course of normal operation of the speed change device, a second abutment member axially and rotatably fixed with respect to said fixed side and defining a maximum limit of axial separation of said movable side relative to said fixed side greater than the first mentioned limit to permit access to the drive belt, and means including releasable stop means mount-

ing said first abutment member for displacement between a first operative position corresponding to the first-mentioned limit and a second retracted position in which the second



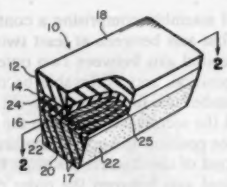
abutment member determines the maximum limit of axial separation between said sides thereby preventing disassembly of the movable side when gaining access to the belt.

4,137,787

EMERGENCY STRETCH BELT

Dale L. Waugh, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Nov. 7, 1977, Ser. No. 849,365
Int. Cl.² F16G *5/16;* B29H *7/22*
U.S. Cl. 74—233 **26 Claims**



17. A power transmission belt structure capable of an elongation of at least 1½ percent comprising a body portion of flexible elastomeric material and a load-carrying section embedded in said body portion including an undulating strength member.

4,137,788

APPLICATION FOR USE WITH A STRAPPING MACHINE FOR DISPLACING AND TENSIONING A STRAPPING BAND ABOUT AN ARTICLE OR THE LIKE

Karl Fischer, Wohlen, Switzerland, assignor to Strapex AG, Hergiswil, Switzerland

Filed Sep. 19, 1977, Ser. No. 834,449
Claims priority, application Switzerland, Oct. 8, 1976, 12792/76
Int. Cl.² F16H *7/08;* B65B *11/00*
U.S. Cl. 74—242.9 **11 Claims**

1. An apparatus for a strapping machine for forwardly displacing and tensioning a strapping band about an article or the like, comprising:

a reversible drive motor;

band rolls operatively coupled with said reversible drive motor and about which there is wrapped the strapping band;

means defining a speed reduction stage provided between said drive means and at least one of the band rolls;

an overload coupling;

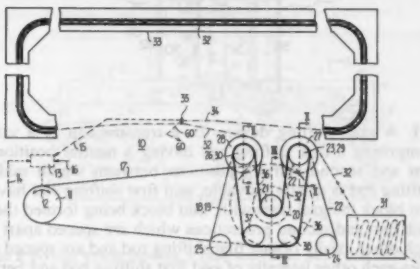
said speed reduction stage being turned-on due to the response of said overload coupling when there is present a direction of rotation of the band rolls corresponding to tensioning of the strapping band;

said band rolls comprising three successively arranged band rolls defining first, second and third band rolls;

form-locking transmission means for operatively coupling said three band rolls with one another for rotating with the same peripheral speed;

said transmission means including a respective transmission element for each band roll;

said transmission means comprising transmission elements associated with the first band roll and the third band roll during a direction of rotation thereof corresponding to the feed direction of the strapping band;



said transmission elements defining a step-up intermediate transmission for the transmission element of the second band roll defining an intermediate band roll;

a first freewheeling coupling which blocks upon response of the overload coupling;

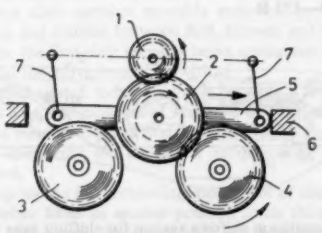
the transmission element of the intermediate band roll, during a direction of rotation thereof corresponding to tensioning of the strapping band, being directly coupled with said drive motor by said first freewheeling coupling and through the agency of the speed reduction stage.

4,137,789

DRIVE ASSEMBLY FOR A MAGNETIC-TAPE DEVICE

Karl Herleth, Munich, Fed. Rep. of Germany, assignor to Magnetronic Gesellschaft fur elektronischmechanische Gerate mbH & Co., Entwicklungs-KG, Munich, Fed. Rep. of Germany

Filed Jun. 24, 1977, Ser. No. 809,523
Int. Cl.² F16H *57/00, 5/52, 15/00*
U.S. Cl. 74—404 **8 Claims**

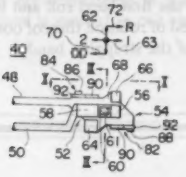


1. A drive assembly for a magnetic recording device of the type including a pair of spaced apart spools, the drive assembly comprising a drive pinion for selectively driving one of the pair of spools, a motor rigidly connected to said pinion, an intermediate toothed gear wheel continuously engaging said pinion and adapted to move about said pinion upon a circular plane, and means for rocking and shifting said gear wheel so that it engages one of the pair of spools, in dependence on the direction of rotation of said pinion.

4,137,790
GEAR SHIFTING DEVICE

Kazuyoshi Hiraiwa, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 19, 1976, Ser. No. 743,415
Claims priority, application Japan, Nov. 22, 1975, 50-139756
Int. Cl.[2] G05G 9/14, 5/02
U.S. Cl. 74—473 R 6 Claims

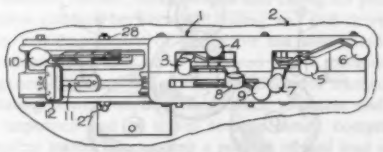


1. A gear shifting device for a transmission of a vehicle, comprising a first shifting rod having a neutral position and first and second shifting positions between which said first shifting rod is axially movable, said first shifting rod having a first block integral therewith, said block being formed thereon with first and second projections which are spaced apart from each other axially of said first shifting rod and are spaced apart from each other laterally of said first shifting rod and between which a space is formed which extends perpendicularly to the longitudinal direction of the first shifting rod, and operating means for operating said first shifting rod, said operating means having a first end portion which is located in said space movably axially of said first shifting rod and perpendicularly to the longitudinal direction of said first shifting rod and which is engageable with said first and second projections, said end portion having in said space first and second neutral positions in which said end portion faces said first and second projections, respectively, and when moved in opposite directions axially of said first shifting rod, engages said first and second projections to move said first shifting rod into said first and second shifting positions, respectively, said block having engaging means which said end portion engages to return said first shifting rod from said first and second shifting positions into said neutral position.

4,137,791
ROTATABLE PIVOTAL TRANSMISSION SHIFT LEVER

Ernest A. Kreitzberg, Mukwonago, and William J. Zajichek, New Berlin, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 11, 1977, Ser. No. 841,191
Int. Cl.[2] G05G 9/16
U.S. Cl. 74—473 R 10 Claims

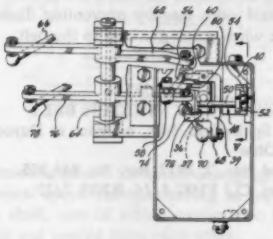


1. A transmission shifting system for shifting gear ratios of a transmission comprising, a shift lever including, a handle on a shaft for controlling the movement of said shift lever, a base rotatably supporting said shaft of said shift lever for rotation on a longitudinal axis, a control console pivotally supporting the base of said shift lever for pivoting on a transverse axis, lever means pivotally supported on said base, an arm on said shaft connected to said lever means for pivoting said lever means when said shaft is rotated, a transmission including a plurality of shifting devices, a shift selector selectively operating one of said shifting devices, a shift selector mechanism connected between said lever means on said shift lever and said shift selector for selecting one of said shifting devices responsive to rotation of said handle, a shifting means connected between the base of said shift lever and said shift selector for selectively shifting one of said shifting devices responsive to pivotal movement of said shift lever.

4,137,792
TRANSMISSION CONTROLS

Lidano Ceccano, Latina, Italy, assignor to Massey-Ferguson Services N.V., Curacoa, Netherlands Antilles

Filed Oct. 14, 1977, Ser. No. 842,442
Claims priority, application United Kingdom, Oct. 16, 1976, 43058/76
Int. Cl.[2] G05G 9/16, 5/04
U.S. Cl. 74—473 R 7 Claims

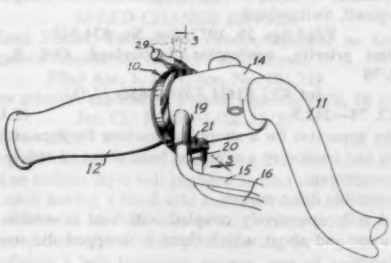


1. A control assembly comprising a control member pivotable about a first axis between at least two discrete positions and about a second axis between two outer positions and an intermediate position, and a movable barrier operable when the control member in a first of the discrete positions to permit pivoting about the second axis between the outer positions via the intermediate position and operable when the control member is in a second of the discrete positions to prevent pivoting about the second axis between the outer positions but allow pivoting about the second axis between either outer position and the intermediate position depending on the pivotal position of the control member about the second axis.

4,137,793
THROTTLE CONTROL DEVICE FOR MOTORCYCLES AND THE LIKE

William E. Sowell, 2424 Hanford Rd. SW., Atlanta, Ga. 30315

Filed Sep. 9, 1977, Ser. No. 831,761
Int. Cl.[2] G05G 1/08; F16D 49/10
U.S. Cl. 74—488 6 Claims



1. A throttle control device, for a throttle apparatus including a handlebar and throttle operating means mounted on said handlebar, said throttle operating means including a sleeve rotatably mounted on said handlebar, said sleeve being adapted for receiving a handgrip thereover, and a housing fixed to said handlebar adjacent to said sleeve, said control device compris-

ing clamping means for selectively holding said throttle operating means in a predetermined position, characterized in that said clamping means includes a disk defining an aperture for receiving said sleeve, said disk being positionable between said handgrip and said housing with said handgrip substantially contiguous to said disk, anchoring means for preventing rotation of said disk with respect to said housing including a tab fixed to said disk and engageable with said housing, said disk including a plurality of sections, means for urging said plurality of sections away from one another to enlarge said aperture and allow free rotation of said sleeve with respect to said disk, and constricting means for urging said plurality of sections towards one another to constrict said aperture and restrict rotation of said sleeve.

4,137,794

DRIVE MECHANISM FOR A MOTOR VEHICLE

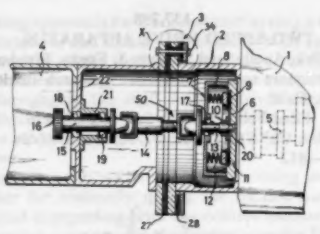
Bernhard Horstmann, Korschenbroich, and Reinhard Wesemeier, Neuss, both of Fed. Rep. of Germany, assignors to International Harvester Company, Chicago, Ill.

Filed Oct. 15, 1976, Ser. No. 732,625

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1975, 2558954

Int. Cl.² B60K *17/00*; F16H *57/02*

U.S. Cl. 74—606 R **4 Claims**



1. A tractor type of vehicle for use in agricultural and industrial operations comprising: an internal combustion engine; a transmission; a clutch; the clutch having a housing connected to the internal combustion engine and the transmission having a housing connected to the clutch housing, the clutch housing and the transmission housing each having radially extending annular external flanges; a first annular elastomer ring positioned between and extending along the adjacent sides of the clutch and transmission housing annular flanges; an annular metallic ring extending along side of one of the flanges; a second annular elastomer ring positioned between and extending along the metallic ring and the one flange, the flanges and the elastomer and metallic rings each having axially aligned holes with a bolt passing therethrough and compressing the elastomer rings along the perimeters of the flanges and metallic ring; a rigid tubular bushing sleeved over the bolt and axially separating the transmission housing flange and the metallic ring; means for permitting limited angular movement between the transmission and clutch housings comprising an axially telescopic drive shaft connection from the clutch to the transmission within the area of the connection of the transmission housing flange to the clutch housing flange; and further including a tubular rubber spring sleeved over the bushing and having the axial extended length shorter than axial distance between the transmission housing flange and the metallic ring; and further including a metallic tube sleeved over the rubber spring and supported in the hole in the clutch housing flange.

4,137,795

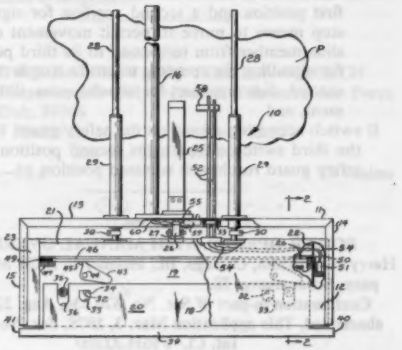
SAFETY GUARD FOR POWER PRESSES

J. Theodore Lindquist, 7654 Tripp Ave., Skokie, Ill. 60076

Filed Jun. 22, 1977, Ser. No. 808,830

Int. Cl.² F16P *1/00*; G05G *25/00*

U.S. Cl. 74—613 **14 Claims**



1. In a power press having a ram movable between first and second positions, power means for moving the ram, clutch means for transmitting power from the power means to the ram, and a foot pedal for operating the ram, a safety guard and control assembly comprising:

a) a safety guard frame mounted on the power press,

b) a safety guard reciprocably mounted on the frame for generally vertical movement between an unactuated position and an actuated position,

c) a sensory member movably mounted on the safety guard and having an edge portion extending below the safety guard, the sensory member being movable upwardly relative to the safety guard between a rest position and a second position when the edge portion of the sensory member engages an object as the safety guard moves from its unactuated position toward its actuated position,

d) means for reciprocating the safety guard,

e) first switch means on the safety guard movable between a first position and a second position,

f) first switch-activating means between the sensory member and the first switch means for moving the first switch means to its second position when the sensory member moves to its second position,

g) control means for operating the power means for moving the ram and the means for reciprocating the safety guard, the control means including:

i) a first slide member movably mounted on the power press and slidable between first, second, and third positions, the first slide member being connected to the foot pedal for movement therewith,

ii) second switch means movable between a first position and a second position in response to movement of the slide member from its first position to its second position for energizing the means for reciprocating the safety guard,

iii) stop means for preventing movement of the first slide member from its second position to its third position, the stop means being movable in response to a signal caused by the safety guard reaching its actuated position to permit movement of the first slide member from its second position to its third poistion,

iv) a second slide member slidably mounted on the power press and connected to the clutch means, the second slide member being movable between a first position in which the clutch means does not transmit power to the ram and a second position in which the clutch means transmits power to the ram,

v) means for coupling the first and second slide members

for simultaneous sliding movement in response to a signal caused by the safety guard reaching its actuated position, the second slide member being movable to its second position by the first slide member as the first slide member moves to its third position when the first and second slide members are coupled,

h) third switch means on the frame movable between a first position and a second position for signalling the stop means to move to permit movement of the first slide member from its second to its third position and for signalling the coupling means to couple the first and second slide member for simultaneous sliding movement, and

i) switch-activating means on the safety guard for moving the third switch means to its second position when the safety guard reaches its actuated position.

4,137,796

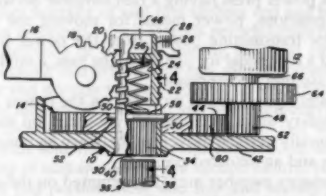
POWER OPENER WITH MANUAL OVERRIDE

Harry H. Bostrom, Chicago, Ill., assignor to ECM Motor Company, Schaumburg, Ill.

Continuation-in-part of Ser. No. 826,334, Aug. 22, 1977, abandoned. This application Mar. 3, 1978, Ser. No. 882,985

Int. Cl.[2] F16H *33/00*

U.S. Cl. 74—625 **24 Claims**



1. A mechanism with manual override, comprising:

power-driven drive gear means;

driven means including a worm operatively driven by said power-driven drive gear means about an axis of rotation, said worm defining an internal disconnecting means-receiving chamber, and an output lever partly defining a worm gear spaced from said axis of rotation and driven by said worm;

a hub defining a crank-receiving socket coaxially aligned with said internal disconnecting means-receiving chamber along said axis of rotation;

manual drive means including a hand crank engageable in said socket for manually driving said driven means; and

disconnecting means at least partly positioned in said internal disconnecting means-receiving chamber and responsive to engagement of said manual drive means with said driven means for disconnecting said driven means from said power-driven drive gear means.

4,137,797

PRIME MOVER MECHANISM

John H. Brems, 32867 White Oaks Trail, Birmingham, Mich. 48010

Division of Ser. No. 643,559, Dec. 22, 1975. This application Oct. 3, 1977, Ser. No. 838,903

Int. Cl.[2] F16H *1/28*

U.S. Cl. 74—801 **3 Claims**

1. A mechanism to generate a substantially square output motion comprising:

(a) a frame member,

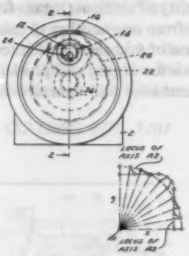
(b) a reaction member mounted on said frame member concentric about a first axis, and adapted for peripheral driving engagement with flexible drive means,

(c) a first rotating member mounted on said frame for rotation about said first axis,

(d) a second rotating member mounted for rotation on said first rotating member and rotating about a second axis displaced from said first axis,

(e) an output member mounted on said second rotating member concentric about a third axis displaced from said second axis,

(f) a first drive member mounted on said second rotating member and adapted for peripheral driving engagement



with flexible drive means and having a pitch diameter one fourth as large as the pitch diameter of said reaction member,

(g) a continuous loop of flexible drive means in peripheral driving engagement with said reaction member and said first drive member, and

(h) driving means to impart rotation to one of said rotating members.

4,137,798

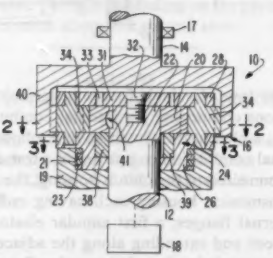
TWO-SPEED DRIVE APPARATUS

Francis J. Sisk, Apollo, and Thomas J. Fagan, Pittsburgh, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 25, 1977, Ser. No. 772,176

Int. Cl.[2] F16H *5/52, 57/10;* B60K *41/24*

U.S. Cl. 74—812 **1 Claim**



1. In a drive apparatus having a reversible motor with a support and a drive shaft rotatable relative to the support, and a driven shaft coaxial with the drive shaft, the improvement comprising: means for coupling the shafts together to permit rotation of the driven shaft in the same direction at two different speeds in response to the rotation of the drive shaft in respective, opposed direction, said means including: a sun gear having means for securing the same to one end of the drive shaft; a ring gear; means coupled with the ring gear for coupling the latter to the driven shaft in surrounding relationship to the sun gear; a planet carrier adapted to be rotatably mounted on said drive shaft at said one end thereof; a pair of planetary gears rotatably mounted on the planet carrier at diametrically spaced locations thereon, said planetary gears being in mesh with said sun and ring gears; an over-running clutch coupled to the planetary carrier and movable into coupled relationship to said drive shaft for preventing rotation of the planetary gears relative to the sun and ring gears when the

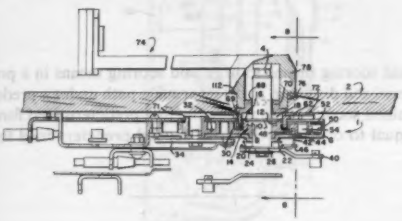
drive shaft rotates in one direction to thereby lock the gears together to cause the driven shaft to be rotated in a first direction at a first speed; and a sprag coupled to the planet carrier and movable into coupled relationship to the support for permitting rotation of the planetary gears about respective, fixed axes relative to the sun and ring gears when the drive shaft rotates in the opposite direction to thereby cause the driven shaft to rotate in said first direction at a second speed different from said first speed.

4,137,799

ADJUSTABLE INTERLOCK HAND LEVER

Roger F. Olsen, Cuyahoga Falls, and George Cantley, Akron, both of Ohio, assignors to Incom International Inc., Pittsburgh, Pa.

Filed Jul. 29, 1977, Ser. No. 820,491
Int. Cl.² B60K *41/04, 20/00, 41/02*
U.S. Cl. 74—876 **20 Claims**



10. Braking apparatus for a control unit having a shaft rotatably supported in and axially translatable with respect to a housing, one end of the shaft connected to a control member externally of the housing, translation of the member toward the housing disengaging the shaft from a driven member positioned within the housing comprising,

a friction member mounted on the shaft adjacent the control member,

spring means positioned to abut the housing and friction member for resiliently urging the friction member into frictional engagement with the control member, and

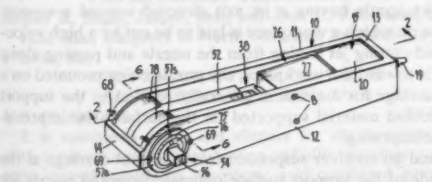
locking means connected to the friction member for preventing rotation of the driven member when the shaft is disengaged from the driven member.

4,137,800

TORQUE WRENCH

George A. Austin, Noble Park, Australia, assignor to Harmat Nominees Pty. Ltd., Australia

Filed Aug. 23, 1977, Ser. No. 827,106
Claims priority, application Australia, Aug. 23, 1976, PC7106
Int. Cl.² B25B *13/46*
U.S. Cl. 81—57.39 **12 Claims**



1. A torque wrench, including a main body, an actuator supported in said main body, a thrust member acted upon by said actuator to be selectively reciprocated relative to said body, a torque arm supported independently of said thrust member and being physically unconnected thereto, an output shaft, a ratchet arrangement incorporated between said torque arm and said output shaft, said thrust member including a curved surface formed thereon which engages a similarly curved surface on said torque arm during reciprocation of said thrust member to impart a pivotal movement to said torque arm about an axis coincident with the axis of the output shaft for providing a torque which is transferred to said output shaft via said ratchet arrangement.

4,137,801

COMBINED RATCHET AND TORSION WRENCH

Charles D. Imperio, 243 Billy Mitchell, Ellsworth Air Force Base, S. Dak. 57706

Filed Feb. 28, 1977, Ser. No. 772,727
Int. Cl.² B25B *13/00*
U.S. Cl. 81—58.1 **15 Claims**

1. For a combination ratchet and torsion wrench having a drive mechanism housing in a wrench head, a lever extending from and for oscillating said head, and a torsion shaft parallel to said lever and moveable between positions of engagement with and disengagement from a drive mechanism in said housing, a drive mechanism comprising: an elongate output shaft having a pawl cage including a ratchet wheel integral with said housing and including a drive end extending from said wrench head and adapted for engaging a tool or other workpiece such as a snap-on socket or screwdriver and having its other end extending interiorly of said head; which pawl cage includes first and second annular pivot plates spaced apart along the axis of said output shaft axis a distance sufficient to accept a pawl, which pivot plate furthest from said output shaft drive end includes a central aperture, each said plate includes pivot pin apertures and said pawl cage includes a pair of pivot pins secured in said pivot pin apertures and extending between said pivot plates; and, coupling and translation means for selectively turning the end of said output shaft extending interiorly of said head in a clockwise and a counter clockwise direction in response to oscillation of said wrench head and rotation of said torsion shaft; which coupling and translation means includes a pair of semi-circular double acting pawls pivotally mounted on said pivot pins within said pawl cage and which pawls are responsive to oscillation of said head to turn said output shaft; which coupling and translation means includes an apertured torsion gear and an apertured shaft extender fixedly interconnected between said output shaft and said torsion gear, which torsion gear, pivot plate central aperture, and shaft extender apertures are concentric and wherein said torsion gear provides disengageable coupling to said torsion shaft and is responsive to rotation of said torsion shaft to rotate said output shaft; a selector for selecting the direction which said output shaft drive end is turned, which selector includes a

spindle extending through said torsion gear and shaft extender and into said pawl cage through said pivot plate central aperture to provide access to and positioning of said pawls by said spindle to select the direction which said output shaft is turned by positioning one end of each of said pawls in engagement with said ratchet wheel for clockwise turning of said output shaft and to position the other end of said pawls in engagement with said ratchet wheel for turning said output shaft in a counter clockwise direction; and, wherein said output shaft and coupling and translation means are a series of seminesting, axial stages which can be assembled as an integral drive mechanism sub-assembly and inserted into and secured by a fastener means in said wrench head drive mechanism housing.

4,137,802

CUTTING TOOL ARRANGEMENT FOR USE IN A LATHE

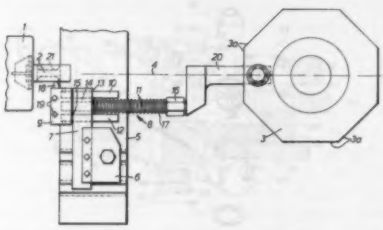
Richard E. Cox, Watford, England, assignor to Dealey & Burrow Limited and Whippendell Electrical Manufacturing Company, both of Watford, England

Filed Dec. 28, 1977, Ser. No. 865,263

Claims priority, application United Kingdom, Dec. 30, 1976, 54387/76

Int. Cl.² B23B *3/28, 3/00, 29/00*

U.S. Cl. 82—11 **9 Claims**



2. A lathe comprising

(a) a rotary driven chuck for holding and rotating a workpiece,

(b) tool carrying means for carrying a plurality of tools, said means being mounted for movement longitudinally of said axis and to rotate to bring different ones of said tools into a position to machine the workpiece,

(c) a cross slide mounted for movement in a direction transverse to the axis of rotation of the chuck,

(d) a support member mounted on the cross slide,

(e) a sliding member mounted on the support member, to slide longitudinally of said axis,

(f) a workpiece cutting tool mounted on the sliding member, and

(g) driving means to move the sliding member relative to the support member for sweeping said workpiece cutting tool longitudinally of the workpiece and in cutting engagement therewith.

4,137,803

SCORING DEVICE HAVING A REFERENCING CARRIAGE

John A. Goldinger, Boiling Springs, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 31, 1977, Ser. No. 801,712

Int. Cl.² B26D *13/08*

U.S. Cl. 83—881 **15 Claims**

1. A scoring device, comprising:

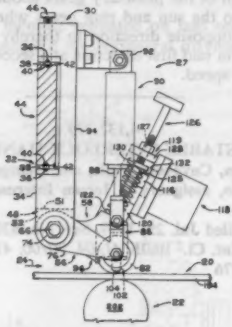
a carriage;

scoring means;

means for mounting said carriage and said scoring means on a common axis for movement of said carriage and said scoring means through respective oscillating arcuate paths;

first biasing means to move said carriage in a first direction along its respective arcuate path under a predetermined first force; and

second biasing means acted on by said carriage and acting on said scoring means to urge said scoring means in a predetermined direction along its arcuate path under a predetermined second force where the first predetermined force is equal to or greater than the second predetermined force.



4,137,804

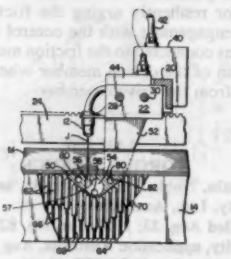
FLUID CUTTING JET RECEIVER

Heinz J. Gerber, and David R. Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology, Inc., South Windsor, Conn.

Continuation-in-part of Ser. No. 488,158, Jul. 12, 1974, abandoned. This application Oct. 7, 1977, Ser. No. 840,493

Int. Cl.² B26F *3/00;* D06H *7/00*

U.S. Cl. 83—177 **29 Claims**



1. In a cutting machine having a cutting tool including a fluid jet nozzle having a jet axis directed toward a support surface on which a workpiece is laid to be cut by a high velocity fluid cutting jet issuing from the nozzle and passing along the axis toward the workpiece, the nozzle being mounted on a tool carriage for movement generally parallel to the support surface and material supported on the surface, the improvement comprising:

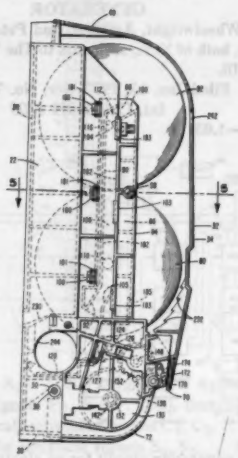
a fluid jet receiver suspended from the tool carriage at the side of the support surface opposite from the nozzle for movement with the jet nozzle parallel to the support surface and positioned to intercept the fluid cutting jet after the jet passes through the workpiece on the support surface and including a jet deflection chamber having a curved inner wall and an inlet aligned with the jet axis and leading into the interior of the deflection chamber tangentially of the curved inner wall.

4,137,805

DISPENSER FOR FLEXIBLE SHEET MATERIAL

Raymond F. DeLuca, Stamford, Conn., and Paul W. Jespersen, Houston, Tex., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Apr. 29, 1977, Ser. No. 792,308
Int. Cl.[2] B65H *19/06*
U.S. Cl. 83—345 3 Claims



1. A dispenser for flexible sheet material, comprising:
(a) a chassis having a front wall and a rear wall;
(b) means operatively connected to said chassis for rotatably supporting an initial roll of flexible sheet material and a reserve roll of flexible sheet material;
(c) means operatively connected to said chassis for guiding a web of flexible sheet material to a position to be grasped by a user so that the user may pull the web out of the dispenser;
(d) a rotatable perforating mechanism operatively connected to said chassis for perforating said web at intervals therealong to divide said web into individual sheets; and
(e) means to feed automatically the web of said reserve roll of said sheet material to said rotatable perforating mechanism after said initial roll of said sheet material has been exhausted a predetermined amount, said automatic feed means including means for engaging the leading edge of the web of said reserve roll to cause said web to buckle, said means for engaging the leading edge being so located as to cause said buckled portion to be urged toward said perforating mechanism.

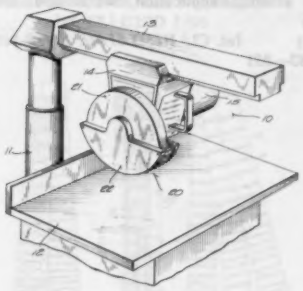
4,137,806

SILENCING MEANS FOR ROTARY CUTTING TOOLS PARTICULARLY CIRCULAR SAWS

Arthur R. Segal, Jasper, Ind., and Jack E. Robertson, Huntsville, Ala., assignors to North American Products Corp., Atlanta, Ga.

Filed Apr. 27, 1977, Ser. No. 791,175
Int. Cl.[2] B27G *19/02;* B23Q *11/06*
U.S. Cl. 83—478 19 Claims

1. A combined guard and silencer for use in combination with a rotary cutting tool having radially projecting cutting teeth spaced around its periphery, said combined guard and silencer being characterized by:
A. a pair of substantially imperforate side wall means, one for each of the axially opposite sides of the cutting tool, each of said side wall means having a shape and an area to overlie substantially all of the axially facing area of the cutting tool;
B. rigid means bridgingly connecting said side wall means to hold them in flatwise opposing relation to one another at axially opposite sides of the cutting tool, said rigid means being substantially imperforate and extending around a major portion of the periphery of the cutting tool to prevent escape of noise from between the side wall means; and



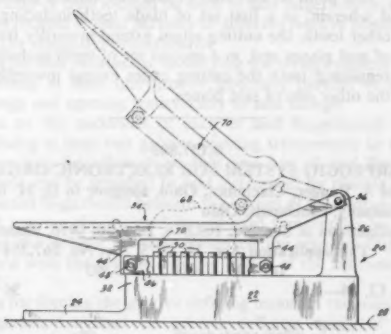
C. sound absorbing means on the opposing inner surfaces of said side wall means, in at least a substantially major portion of the area thereof that extends radially inwardly from a zone near the gullets of the cutting teeth.

4,137,807

MANUAL SLICER AND DICER APPARATUS FOR FRUITS AND VEGETABLES

Arnold G. Schaumberg, Rte. 3, Box 295, Hartford, Wis. 53027

Filed Aug. 3, 1977, Ser. No. 821,396
Int. Cl.[2] B26D *3/18, 3/26*
U.S. Cl. 83—599 3 Claims



1. A manually-operated food cutting device comprising: a base member for providing horizontal support to the cutting apparatus, said base member further characterized as having a plurality of upstanding peg members mounted on the upper portion thereof to support the food article to be cut; a cutter assembly characterized as being pivotally mounted at one of its ends to said base member and having a handle portion at its other end and a knife support frame at its central portion; a plurality of cutting blades mounted on the knife support frame, each of said cutting blades characterized as presenting two substantially right-angled cutting edges to the food article being cut; sleeve mounting means carried by said knife support frame; and a dicing assembly characterized as having a dicer frame conforming to the shape of said knife support frame and a plurality of cutter means mounted in parallelism to said dicer frame, whereby said dicing assembly is operable to be mounted in said sleeve mounting means adjacent and at right-angle alignment to said knife support frame to effect dicing of the food article.

4,137,808
TOOTH STRUCTURE FOR BURR-FREE CUTTING SAW BLADE

Lothar Mattes, Singen, Fed. Rep. of Germany, assignor to Georg Fischer, Switzerland

Filed Dec. 2, 1977, Ser. No. 856,973
Claims priority, application Switzerland, Dec. 29, 1976, 16427/76
Int. Cl.[2] B23D *61/02, 61/12*
U.S. Cl. 83—851 4 Claims

1. A saw blade for burr-free cutting of materials, the blade being of the type having generally planar side surfaces lying in substantially parallel planes and a plurality of cutting teeth along one edge thereof, said blade having a predetermined cutting direction parallel with said side surfaces, the improvement wherein

each of said teeth includes

a cutting edge extending transversely across only a predetermined portion of the distal end of the tooth from one of said side surface planes to a point between said planes, said cutting edge lying along a line which is inclined relative to a line extending perpendicularly between the planes of said side surfaces, and

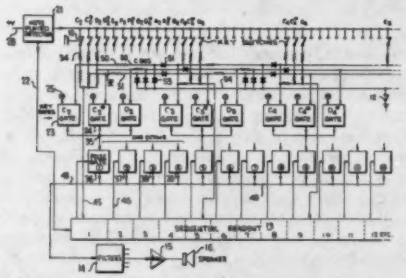
an inclined generally triangular surface extending from said point to the other of said side surface planes,

and wherein, in a first set of blade teeth including every other tooth, the cutting edges extend inwardly from one of said planes and, in a second set of teeth including the remaining teeth the cutting edges extend inwardly from the other one of said planes.

4,137,809
ARPEGGIO SYSTEM FOR ELECTRONIC ORGANS

David A. Bunger, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Continuation of Ser. No. 102,874, Dec. 30, 1970, abandoned. This application Apr. 11, 1975, Ser. No. 567,354
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.03 36 Claims

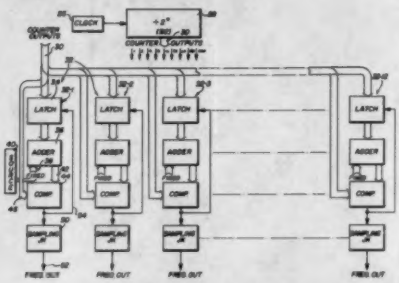


1. A musical instrument comprising a generator means for producing a series of signals corresponding to a plurality of musical tones, a keyboard, a set of key-operable switches operable by the keys of said keyboard; a series of control gates for selectively interconnecting the key-operable switches in circuit with said generator means for producing tones in response to operation of said control gates, and scanning means for sequentially scanning in an up-down sequence said key-operated switches and for operating said control gates for a predetermined interval in response to operated ones of said key-operated switches.

4,137,810
DIGITALLY ENCODED TOP OCTAVE FREQUENCY GENERATOR

Robert W. Wheelwright, Amherst, and Peter E. Solender, Williamsville, both of N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed Jan. 12, 1977, Ser. No. 758,598
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.03 27 Claims



1. A tone generating circuit for an electronic musical instrument comprising means for producing a predetermined frequency, a common digital counter having an input connected to said frequency producing means and having common output means, a plurality of parallel frequency branches connected to said common output means and each comprising a digital processing circuit having a digital output which is either a logical one or zero, and number source means connected to said frequency branches to alternate the digital output between one and zero at a rate determined jointly by said predetermined frequency and said number source means, thus to construct a rectangular wave output of different frequency from each frequency branch.

4,137,811
ELECTRICAL STRING-INSTRUMENT

Ikutaro Kakehashi, Osaka, Japan, assignor to Roland Corporation, Osaka, Japan

Filed Jun. 16, 1977, Ser. No. 807,073
Claims priority, application Japan, Jun. 16, 1976, 51-71618
Int. Cl.[2] G10H *3/00*
U.S. Cl. 84—1.16 2 Claims

1. An electrical string-instrument comprising:

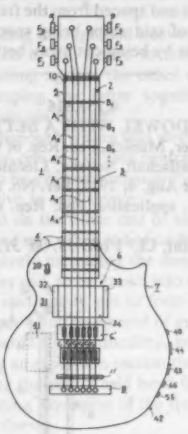
N strings $A_1, A_2, \ldots A_N$;

a support member having a major surface including a string receiving surface and stretching the strings A_1 to A_N in opposing relation thereto to extend in substantially the same plane in parallel relation to one another;

a plurality of frets disposed on the string receiving surface, which frets are sequentially disposed in the direction of extension of the strings A_1 to A_N to extend in the direction perpendicular thereto;

electromechanical transducer means $C_1, C_2, \ldots C_N$ disposed in the area other than the string receiving area in the area opposite to the strings A_1 to A_N on the major surface of the support member for converting mechanical vibrations of the strings $A_1, A_2, \ldots A_N$ into corresponding electrical signals $E_1, E_2, \ldots E_N$, respectively;

means by which, based on the electrical signals $E_1, E_2, \ldots E_N$, in the case where the electrical signal E_i ($i = 1, 2, \ldots N$) is obtained and then one (hereinafter identified by E_p) of the electrical signals E_1 to E_N except E_i is obtained, a gate signal S_i is produced which has a value "1" in the

binary representation from the moment of generation of the electrical signal E_i to the moment of generation of the electrical signal E_j; and

N gate means $X_1, X_2, \ldots X_N$ for gating N signals based on the electrical signals $E_1, E_2, \ldots E_N$ derived from the electromechanical transducer means $C_1, C_2, \ldots C_N$ under the control of the electrical signals $S_1, S_2, \ldots S_N$, respectively.

4,137,812

DEVICE FOR CONTINUOUS PITCH VARIATION OF STRINGED INSTRUMENTS

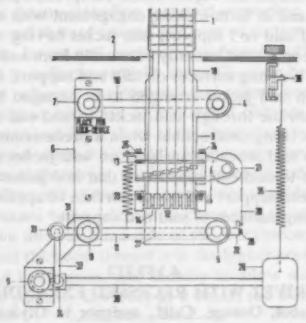
Rainer Franzmann, Mittelstrasse 24, 2000 Norderstedt 2, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 613,803, Sep. 16, 1975, Pat. No. 4,044,645. This application Aug. 4, 1977, Ser. No. 821,971

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2635905; Apr. 2, 1977, 2704636; Apr. 2, 1977, 2704637

Int. Cl.² G10D *3/00*

U.S. Cl. 84—313 **7 Claims**



1. A stringed musical instrument comprising a body having a bottom, support lever means mounted for pivotal movement substantially in a plane parallel to said bottom, a neck and an extension piece thereof supported by said support lever means, to connect said extension in movable relation to said body, stringholder means carried by said neck extension piece, strings attached to said stringholder means, and means responsive to pivotal movement of said support lever means for varying the tension of said strings.

4,137,813

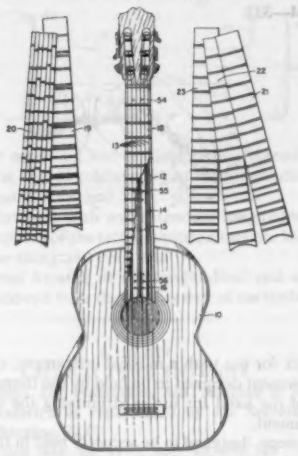
FINGERBOARD ATTACHMENT FOR STRINGED INSTRUMENTS

Thomas D. Stone, Fairfield, Iowa; Michael J. Felgen, San Rafael, and Heiko T. de Man, Gualala, both of Calif., assignors to Intonation Systems, Fairfield, Iowa

Filed Apr. 7, 1978, Ser. No. 894,306

Int. Cl.² G10D *3/06*

U.S. Cl. 84—314 **13 Claims**



1. Apparatus for providing a stringed musical instrument with at least two different tonal scales comprising:

at least two fretted fingerboards;

a plurality of frets located on each of said fingerboards, said frets located at least partially at different relative positions on the respective fingerboards;

means on said instrument underlying the strings thereof for defining at least one groove generally parallel to said strings and opening transversely to said strings;

means on the underside of each of said fingerboards for defining at least one groove opening transversely to said respective fingerboards so that any one of said fingerboards can be attached to said instrument by placing the selected fingerboard beneath the strings of the instrument and moving the selected fingerboard transversely to engage the groove defining means on the selected fingerboard with the groove defining means of the instrument; and

means for forcing the groove defining means of the selected fingerboard against the groove defining means of the instrument to secure the selected fingerboard to the instrument, said forcing means being releasable for removal of said selected fingerboard from the instrument and replacement with another.

12. An improvement in a stringed instrument in which the instrument is adapted to utilize discrete fingerboards having frets located at least partially at different relative positions on the respective fingerboards, each fingerboard having on the underside thereof at least one groove opening transversely to the respective fingerboard, said improvement comprising means on said instrument underlying the strings thereof for defining at least one groove generally parallel to said strings and opening transversely to said strings so that any one of the fingerboards can be attached to said instrument by placing the selected fingerboard beneath the strings of the instrument and moving the selected fingerboard transversely to engage the groove defining means on the selected fingerboard with the groove defining means of the instrument; and means for forcing the groove defining means of the selected fingerboard against the groove defining means of the instrument to secure the selected fingerboard to the instrument, said forcing means

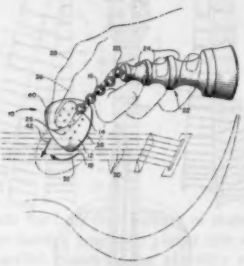
being releasable for removal of said selected fingerboard from the instrument and replacement with another.

4,137,814

NONSLIP GUITAR PICK

Peter C. Rowley, Santa Ana, Calif., assignor to Roy Surrette, Santa Ana, Calif.

Filed Oct. 17, 1977, Ser. No. 842,756
Int. Cl.[2] G10D *3/16*
U.S. Cl. 84—322 **10 Claims**



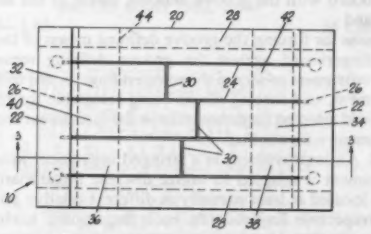
1. A pick for use with a musical instrument, comprising:
a pick element designed to be held by the thumb and forefinger of the hand for use in strumming the strings of said instrument;
a palm piece, designed to be securely held in the palm of the hand; and
flexible connecting means between said pick element and said palm piece, said means transmitting exclusively a tensile force between said pick element and said palm piece when said pick element is held a sufficient distance from said palm piece, said tension maintaining the proper orientation of said pick element with respect to said strings and substantially preventing slippage of said pick from said thumb and forefinger.

4,137,815

MULTI-TONE MUSICAL DRUM

Hyman Kloc, 2007 Stearns Ave., Kalamazoo, Mich. 49008

Filed Mar. 14, 1977, Ser. No. 777,109
Int. Cl.[2] G10D *13/08*
U.S. Cl. 84—408 **5 Claims**



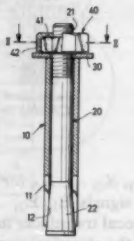
1. A multi-tone musical drum comprising:
wooden walls forming an open topped resonating chamber with opposed end walls and side walls of equal height, and an integral sounding panel of wood having its ends secured to the tops of said end walls, said panel being slotted to provide:
(a) spaced longitudinal slits dividing the intermediate portion of the panel into side strips and at least two interior strips, and
(b) transverse slits each formed at a different distance from both of said end walls and dividing the interior strips into separate vibratory fingers overlying the resonating chamber,
the underside of said panel being cut away to provide areas of reduced thickness in each of said fingers adjacent to said end walls and spaced from the free ends of the fingers, the undersides of said strips being spaced from the tops of said side walls by being cut away between said end walls.

4,137,816

EXPANSION DOWEL WITH A SETTING CONTROL

Karl-Heinz Gärtner, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Aug. 4, 1977, Ser. No. 821,925
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1976, 2635806
Int. Cl.[2] F16B *13/06, 31/02*
U.S. Cl. 85—61 **6 Claims**



1. An expansion dowel comprising an elongated expansion sleeve having a first end and a second end, said sleeve having a bore extending therethrough from the first end to the second end, an axially elongated tie rod extending through the bore in said sleeve from the first and toward the second end, said tie rod having a first end located adjacent the first end of said sleeve and a second end located adjacent the second end of said sleeve, an expanding body connected to the second end of said tie rod and arranged to be pulled into the second end of the bore in said sleeve toward the first end thereof for expanding said sleeve, an end support positioned on the first end of said tie rod and located exteriorly of the first end of said sleeve, said end support having working surfaces extending laterally around the axis of said tie rod for applying torque to said end support, wherein the improvement comprises a jacket laterally enclosing and in form-locking engagement with said working surfaces of said end support, said jacket having working surfaces thereon spaced laterally outwardly from and corresponding to the working surfaces on said end support, said working surfaces on said jacket arranged to be engaged by a tool for applying torque through said jacket to said end support, and said jacket being destructible when a predetermined torque is applied to said working surfaces on said jacket and through said jacket to said end support so that said jacket is displaced from said end support and a tool can then be applied directly to said working surfaces of said end support.

4,137,817

BLIND RIVET WITH RECESSED EXPANDING HEAD

George Siebol, Orange, Calif., assignor to Olympic Fastening Systems, Inc., Downey, Calif.

Continuation of Ser. No. 244,408, Apr. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 879,201, Nov. 24, 1969, Pat. No. 3,657,957. This application Jun. 1, 1976, Ser. No. 691,875
Int. Cl.[2] F16B *19/10*
U.S. Cl. 85—78 **10 Claims**

1. In a blind rivet for joining two side-by-side workpieces having aligned holes for receiving said rivet and having a combined thickness within a predetermined range of thicknesses, the combination of:

a tubular sleeve longer than the combined thickness of the workpiece to be riveted and having a first head on one end for engaging one side of the workpieces;

stop means on said sleeve adjacent said first head;

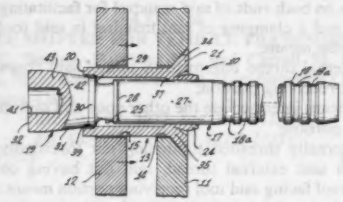
and

a setting pin extending through said sleeve for use in expanding the other end of the sleeve to form a second head thereon for abutting against the other side of the workpieces and clamping the latter together between said heads, said setting pin having:

a central section disposed within said sleeve;

a pulling section on one end of said central section adjacent said first head to be gripped preparatory to pulling of said setting pin relative to said sleeve;

an expanding head on the other end of said central section projecting beyond said other end of said sleeve and having a taper progressively increasing the diameter of said head beyond said other end, to be drawn into said sleeve during such pulling of said setting pin to form said second head thereon, said taper being composed of material of substantially uniform hardness and ductility, and said expanding head also having an expansion section thereon, including a shoulder forming the end of said head facing toward said sleeve, for initiating expansion of the sleeve as the head is drawn into the sleeve;



said stop means being engageable with said shoulder as the latter is drawn through said sleeve to a preselected position within the sleeve, to resist further movement of said expanding head into said sleeve when said shoulder is adjacent said first head and adjacent said one side of the workpieces;

means for causing said pin to break off adjacent said first head with said taper inside said sleeve after said stop means abuts against said shoulder;

and recess means extending into said expanding head from the free end thereof toward said central section and weakening the larger end portion of said taper sufficiently to allow it to collapse partially inwardly upon being drawn into the adjacent workpiece, said recess means being positioned in said head a preselected distance from said shoulder to terminate short of the shear plane between the workpieces when the shoulder is in engagement with said stop means, thereby to avoid weakening of said pin in said shear plane, the distance between said shoulder and said recess means being selected to cause said recess means to be drawn into the blind side of the workpieces when the combined thickness thereof is in the higher portion of said range of thicknesses, and thereby to allow said taper to collapse partially inwardly as it enters the workpieces.

4,137,818

UNITARY STRUCTURE TATTING SHUTTLE

Florene K. Loranger, 1512A-1 Gatehouse Cir. So., Colorado Springs, Colo. 80904

Filed Jul. 19, 1977, Ser. No. 817,098

Int. Cl.[2] D04C *7/00*

U.S. Cl. 87—58 **6 Claims**

1. Handcraft tatting shuttle comprising

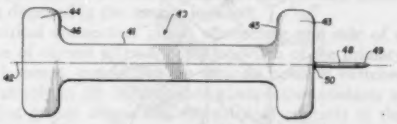
an elongated core having a longitudinal axis, leading end, and trailing end,

leading and thread guard means of greater lateral dimension than the lateral dimension of such core,

trailing end thread guard means having a greater lateral dimension than the core,

such core being unitary with such leading and trailing end thread guard means,

such core, in combination with such leading and trailing end thread guard means, providing a laterally-open, spool-like



space for receiving and holding tatting thread wrapped laterally in angled relationship to the longitudinal axis of the elongated core, and

pin means integral with and extending longitudinally from the leading end of the tatting shuttle along the longitudinal axis of the elongated core, and

a hook means located at the longitudinal end of the pin means removed from the leading end of the tatting shuttle.

4,137,819

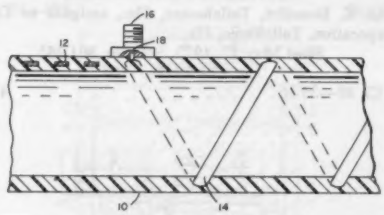
LAUNCH TUBE ANTENNA

Jester M. Loomis, III, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1977, Ser. No. 855,149

Int. Cl.[2] F41F *3/04*

U.S. Cl. 89—1.813 **3 Claims**



1. A tube for launching a missile and providing a communication link between the tube and the operator, comprising: a launch tube made of fiberglass material; arm and fire wiring disposed at one end of said tube, and an antenna embedded in said tube and disposed from said wiring for providing communication signals from the operator to the missile while in flight.

4,137,820

AMMUNITION HANDLING AND LOADING SYSTEM

John E. Clemens, Xenia, Ohio, assignor to Tesseract Corporation, Tallahasee, Fla.

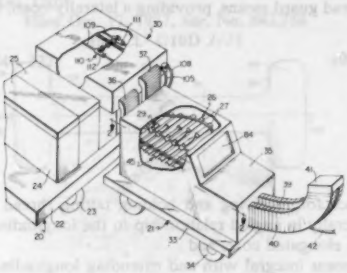
Filed Dec. 9, 1977, Ser. No. 858,992

Int. Cl.[2] F42B *39/12*

U.S. Cl. 89—33 BB **19 Claims**

1. Apparatus for handling elongated slender articles which are generally cylindrical in cross-section, comprising first and second endless conveyor means, said first conveyor means including a plurality of article receiving members each having separate first and second sections spaced apart a predetermined distance, each of said first sections being in alignment with a cooperating second section, means for driving said first and second sections simultaneously, said cooperating sections each receiving an elongated slender article, said second conveyor means having a plurality of spaced article receiving elements, a portion of said second conveyor means being positioned

between said first and second sections of said first conveyor means, means for driving said second conveyor means in synchronization with said first conveyor means, said article receiving members of said first conveyor means and the article receiving elements of said second conveyor means being arcuate in cross-section and generally complementary to the cross-



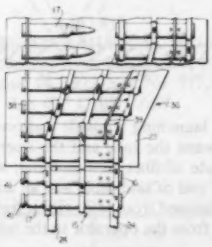
sectional configuration of said articles, and said article receiving elements of said second conveyor means intercepting the articles carried by said article receiving members of said first conveyor means so that said elements of said second conveyor means remove the articles from said members of said first conveyor means.

4,137,821

ARTICLE HANDLING BELT

Charles E. Benedict, Tallahassee, Fla., assignor to Tesseract Corporation, Tallahasee, Fla.

Filed May 27, 1977, Ser. No. 801,263
Int. Cl.² F42B *39/08*
U.S. Cl. 89—35 R **4 Claims**



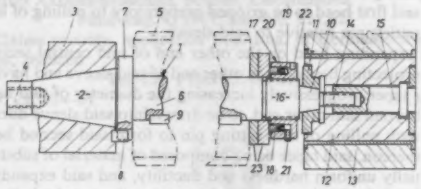
1. An article handling belt of indeterminate length which is movable along a predetermined path comprising a plurality of elongated hollow generally cylindrical sleeves, each of said sleeves having a longitudinal axis disposed generally normal to said path of movement of said belt, the longitudinal axes of said sleeves being in generally parallel relationship with each other and spaced apart a distance greater than the diameter of said sleeves, each of said sleeves having at least two annular web-receiving means in spaced relationship to each other along the length of the sleeve, a plurality of flexible endless webs connecting each of said sleeves to at least one adjacent sleeve, each of said webs having a pair of loops of a size to be received by the web-receiving means of adjacent sleeves, means for moving said belt along said path of movement, and means for moving said sleeves axially relative to each other while travelling along said path of movement and while the axes of said sleeves remain generally parallel with each other.

4,137,822

MANDREL FOR RECEIVING THE TOOL IN A HOBBING MACHINE OR A SIMILAR MACHINE

Horst Behnke, Zorneding, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen-und Zahnradfabrik, Munich, Fed. Rep. of Germany

Filed Apr. 22, 1977, Ser. No. 789,827
Claims priority, application Fed. Rep. of Germany, May 21, 1976, 7616406[U]
Int. Cl.² B23Q *3/14*; B23F *5/22*
U.S. Cl. 90—11 A **6 Claims**



1. A mandrel for supporting on a tool receiving portion thereof a tool of a tool machine having a tool machine spindle means thereon, comprising:

a cone on both ends of said mandrel for facilitating a centering and a clamping of said mandrel in said tool machine spindle means;

an external thread intermediate one of said cones and said tool receiving portion;

stop means intermediate the other cone and said tool receiving portion;

an internally threaded tightening nut threadedly engaged with said external thread, said nut having on the side thereof facing said tool receiving portion means defining a single annular recess therein of uniform radial thickness and an annular piston reciprocally received in said recess and projecting axially from said nut, sliding seal means for sealing said piston to the walls of said recess, the axial spacing between said piston and the walls of said recess defining a single chamber;

fluid means in said chamber; and

an adjusting screw on said nut, the inner end of which projects directly into said chamber for effecting a varying of the volume of said chamber and a displacement of said fluid means and causing an axial movement of said piston to effectively clamp said tool between said piston and said stop means.

4,137,823

METHOD OF MACHINING WINDING SLOTS OF GENERATOR ROTORS

Kurt Bäuml, Nürtingen; Otto C. Gunsser, Zizishausen, and Rudolf K. Lohse, Nurtingen, all of Fed. Rep. of Germany, assignors to Gebruder Heller Machinenfabrik GmbH, Nürtingen, Fed. Rep. of Germany

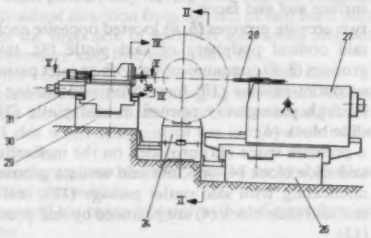
Division of Ser. No. 560,177, Mar. 19, 1975, Pat. No. 4,056,039.
This application Aug. 22, 1977, Ser. No. 826,339
Int. Cl.² B23D *37/06*
U.S. Cl. 90—64 **1 Claim**

1. An improved method of machining winding slots in generator rotors, wherein the method is of the type in which each slot is first cut out of a solid rotor block workpiece by means of a side mill cutter, each slot having parallel walls, and then the final groove form is worked out by finishing the slot walls, wherein the improvement comprises finishing the slot by the steps of

holding the workpiece at rest,

planing each workpiece slot while the workpiece is held at rest, with a tool having a plurality of cutting edges for the forward and backward strokes of the tool, said edges are disposed in two rows lineraly one behind the other and

displaced with respect to each other by one depth of the cut for the forward and backward strokes of the tool, the tool including a plate shaped support having a longitudinal edge on which the cutting edges are carried, said planing operation including finishing one side of said slot



during the forward stroke of the tool and finishing the other side of said slot during the backward stroke of the tool, and

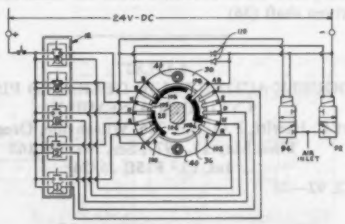
controlling both the depth of which the tool extends into the slot and the depth of penetration of the tool perpendicularly into the slot walls by means of a copying device.

4,137,824

REMOTE SHIFTER FOR VEHICLE TRANSMISSIONS

Richard G. Boutell, Danville, Ky., and Carroll M. Grigsby, Raleigh, N.C., assignors to Scovill Manufacturing Company, Waterbury, Conn.

Filed Jan. 31, 1977, Ser. No. 763,978
Int. Cl.² F01B *31/12*; F15B *13/16*
U.S. Cl. 91—1 **5 Claims**



1. A shifter operable from a remote location for shifting a vehicle transmission, the transmission having a rotary operator with the shift positions in a certain rotary sequence, the shifter comprising:

(a) a housing means adjacent the transmission;

(b) a first and second piston-cylinder units mounted in aligned opposed disposition in the housing means, the pistons being connected by a rigid connecting rod;

(c) air supply means to the cylinders controlled respectively by a pair of electric solenoid-operated valves, the solenoids having two positions: an "on" position connecting the air supply to the associated cylinder, and an "off" position closing the connection and venting the associated cylinder to atmosphere;

(d) a shaft journalled for rotation in the housing, the shaft adapted to be operatively connected to the operator and having an arm connected at a point spaced from the axis of the shaft to an intermediate portion of the connecting rod;

(e) rotary secondary switch means mounted on the housing means and having a central rotor mounted on the shaft and an annular stator mounted about the rotor, a first group of stator contacts on the rotary switch means representing the shift positions and arranged in the same rotary sequence as the shift positions, a pair of solenoid contacts at the opposite ends of the first group of contacts respectively, a pair of spaced coarcuate conductive strips on the rotor opposite the first group, the strips always respectively contacting the solenoid contacts and other contacts in the first group, so that as the rotor turns each contact in the group contacts the strip and is closed except for one overlying the space between the strips, the open one moving in seriatum through said first group as the shaft rotates;

(f) primary switch means including a position switch for each position of the shifter, said primary switch means being disposed in the remote location;

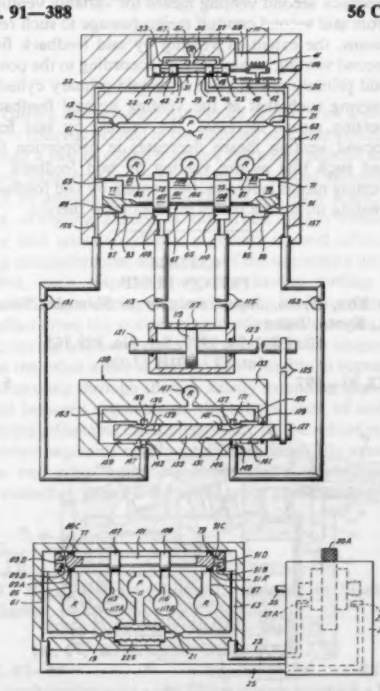
(g) electrical connection means connecting one side of a source of current to each position switch of the primary switch means, connecting the separate position switches respectively to the corresponding respective contacts in the first group, connecting the solenoid contacts to the solenoids respectively so that the proper solenoid will be activated when a given position switch is closed, and connecting the other side of the solenoids to the other side of the current source, whereby closing one of the position switches activates one of the solenoid valves to the "on" condition to pressurize one of the piston cylinders and move the operator to the corresponding shift position at which the solenoid is "off" as the space between the strips underlies the corresponding position contact and both cylinders are vented to atmosphere.

4,137,825

FLUIDIC REPEATER

Willie B. Leonard, 5902 Royalton, Houston, Tex. 77036

Division of Ser. No. 489,829, Jul. 18, 1974, Pat. No. 3,988,966.
This application Sep. 3, 1976, Ser. No. 720,410
The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.
Int. Cl.² F15B *13/16, 15/22*
U.S. Cl. 91—388 **56 Claims**



1. Fluidic repeater to be connected to a source of pressurized fluid and to reservoir means for storing fluid at a pressure lower than that of such source, the fluidic repeater comprising:

first and second conduit means for conveying pressurized fluid supplied by such source, each said conduit means including a fluid passage, source connection means for connecting the passage to such source, and source restrictor means for restricting fluid flow through the source connection means to the passage;

transmitter means for creating a fluid pressure differential between said first and second conduit means passages, said transmitter means including transmitter first venting means for variably venting fluid from said first conduit means passage to such reservoir means, and transmitter second venting means for variably venting fluid from said second conduit means passage to the same reservoir to which said first venting means vents, said transmitter being positionable over a range of positions including a first position of maximum venting and a second position of minimum venting and various positions between said first and second positions to produce different amounts of movement of the responder means for each transmitter position within said range of positions;

responder means for providing mechanical displacement in response to fluid pressure differential between said first and second conduit means passages, said responder means including (a) a primary cylinder connected at one end to said first conduit means passage and at the other end to said second conduit means passage, and (b) a primary piston disposed in said primary cylinder and axially-movable between said ends of said primary cylinder; and

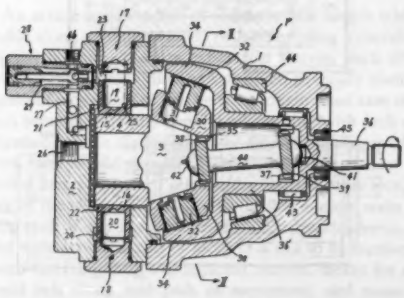
feedback means for eliminating fluid pressure differential between said first and second conduit means passages so as to stop the mechanical displacement provided by said responder means, said feedback means including feedback first venting means for variably venting fluid from said first conduit means passage to such reservoir means, and feedback second venting means for variably venting fluid from said second conduit means passage to such reservoir means, the extent of venting by said feedback first and second venting means varying according to the position of said primary piston relative to said primary cylinder and varying such that as the venting by said feedback first venting means increases, the venting by said feedback second venting means decreases in proportion thereto, and such that as the venting by said feedback second venting means increases, the venting by said feedback first venting means decreases in proportion thereto.

4,137,826

PISTON PUMP

Yasuo Kita, Kyoto, Japan, assignor to Shimadzu Seisakushi, Ltd., Kyoto, Japan

Filed Jul. 28, 1977, Ser. No. 819,763
Int. Cl.[2] F01B *13/06*
U.S. Cl. 91—497 **6 Claims**



1. A piston pump comprising:

a. a casing defining an enclosed chamber of the pump together with closing means (2);

b. a circular truncated pintle (3) with a conical periphery held by a slide block (4) slidably supported on said closing means (2) within said enclosed chamber, said slide block (4) having a trapezoidal cross-section with an inclined surface and end faces;

c. two arcuate grooves (5, 6) located opposite each other on said conical periphery of said pintle (3), said arcuate grooves (5, 6) communicating with an inlet passage (9) and an outlet passage (10) formed on said closing means (2) through passageway opened in said pintle (3) and said slide block (4);

d. a pressure space (12) provided on the inclined surface of said slide block (4) opposite said arcuate groove (6) communicating with said outlet passage (10), said pintle (3) and said slide block (4) are balanced by said pressure space (12);

e. a cylinder block (30) having a plurality of cylindrical apertures arranged radially and vertically with respect to the conical periphery of said pintle (3), said cylinder block (30) being rotatably disposed over the conical periphery of said pintle (3);

f. a a plurality of pistons (32*a*, 32*g*) with end faces, said pistons being disposed in each cylindrical aperture of said cylinder block (30);

g. a cylindrical cup (36') with cup lips holder (34) having a plurality of flat faces (33*a*, 33*g*) in the interior wall thereof in contact with said outer end faces of said pistons (32*a*, 32*g*), said pistons being kept between said cylindrical holder (34) and said cylinder block (30);

h. a driven shaft (36) coupled to said cup (36') for rotating said cylinder block (30) and said holder (34) together round the conical periphery of said pintle (3); and,

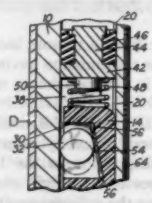
i. means for sliding said slide block so that the axial center of said pintle (3) is eccentric from the axial center of said driven shaft (36).

4,137,827

DOUBLE ACTING FLUID OPERATED PISTON CYLINDER ASSEMBLY

Delbert C. Hewitt, P.O. Box 316, Wilsonville, Oreg. 97070

Filed May 18, 1977, Ser. No. 798,163
Int. Cl.[2] F15B *15/26*
U.S. Cl. 92—24 **4 Claims**



1. A double acting fluid operated piston cylinder assembly comprising

(a) an elongated cylinder housing having defining wall portions and opposite ends arranged alternately to receive actuating fluid,

(b) a piston assembly including a main piston body molded from a resinous plastic material,

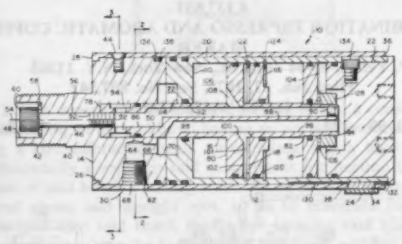
(c) said piston body having an open transverse slot extending thereacross,

(d) the bottom of said slot extending angularly relative to the longitudinal center line of the cylinder housing and of said main piston body and having end portions one of which is a low side of greater depth and the other of which is high side of less depth,

(e) a metal insert seated on said bottom of the slot,

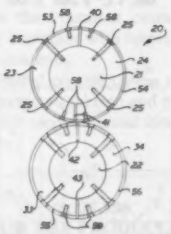
(f) a clutch roller in said slot having opposite ends and rotatably engageable at its opposite ends on said metal insert,
(g) said clutch roller being of proper size to have clutching engagement between said metal insert and a wall portion of said cylinder housing when said roller moves from the low side towards the high side of said slot bottom,
(h) said main piston body having a second slot extending in a londitudinal direction from the end of said main member nearest the high side of said first mentioned slot bottom and traversing said first mentioned slot,
(i) a clutch control bar slidable in said second slot,
(j) means on said control bar engaging said clutch roller so as to cause movement of said clutch roller in said first mentioned slot when said control bar is moved in said main piston body,
(k) a secondary piston member located beyond said end of said main piston body,
(l) said control bar being integral with said secondary piston member,
(m) and spring means interposed between said main piston body and said secondary piston member and normally acting to cause said control bar to pull said clutch roller toward said high side of said first mentioned slot bottom, whereby said clutch roller and control bar and spring means will act to prevent travel of said piston assembly in the cylinder in one direction except when the actuating fluid in said cylinder thrusts said secondary piston closer to said main piston body against the force of said spring means, thereby automatically causing said clutch roller to be moved by said control bar into releasing position.

4,137,828
WELDING GUN
Charles Senn, 12633 Wilfred, Detroit, Mich. 48213
Filed Aug. 17, 1977, Ser. No. 825,255
Int. Cl.[2] F01B *15/02*
U.S. Cl. 92—117 R **11 Claims**



1. A welding gun for welding airport concrete mesh or the like comprising an outer cylinder having an axis of generation, an end cap secured in one end of the outer cylinder, a shaft, means for securing the shaft to the center of the end cap within the outer cylinder at one end thereof with the shaft extending along the axis of generation of the outer cylinder, an inner cylinder having a radially extending piston portion at one end thereof with an axially extending hole therethrough for receiving the shaft which is positioned within the outer cylinder over the shaft for reciprocal movement relative to the outer cylinder along the axis of generation thereof, whereby a first welding gun extension pressure chamber is formed between the radially extending piston portion of the inner cylinder and the end cap in the one end of the outer cylinder in conjunction with the outer cylinder, a piston secured to the shaft centrally thereof on the side of the piston portion of the inner cylinder opposite the end cap in the outer cylinder and extending radially from the shaft to the inner wall of the inner cylinder forming a welding gun retraction pressure chamber between the adjacent surface of the radially extending piston portion of the inner cylinder and one surface of the piston secured to the shaft, a radially extending annular piston secured to the inner cylinder substantially centrally thereof through which the shaft extends, whereby a second welding gun extension pressure chamber is formed between the other surface of the piston member secured to the shaft and one surface of the piston secured to the inner cylinder in conjunction with the shaft and the inner cylinder, an annular piston secured to the other end of the shaft on the side of the annular piston secured to the inner cylinder opposite the piston secured to the shaft centrally thereof, an end cap positioned in the other end of the inner cylinder on the side of the piston secured to the other end of the shaft opposite the piston secured to the inner cylinder, whereby a third welding gun extension pressure chamber is formed between the annular piston secured to the other end of the shaft and the end cap in the other end of the inner cylinder in conjunction with the shaft and the inner cylinder, means for passing a pressure transfer medium into and out of the welding gun extension pressure chambers simultaneously and means for passing a pressure transfer medium into and out of the welding gun retraction pressure chamber.

4,137,829
CUTTING APPARATUS
Albert J. Sarka, 18828 Canyon Dr., Fairview Park, Ohio 44126
Filed Jan. 19, 1977, Ser. No. 760,663
Int. Cl.[2] B31B *1/16*
U.S. Cl. 93—36 A **10 Claims**



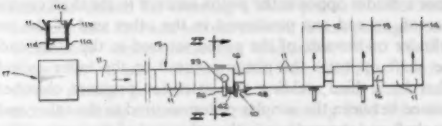
1. A cutting unit adapted to operate in line with a printing unit to cut material printed in the printing unit, said cutting unit comprising a pair of cylinder arbors extending parallel to each other and transverse to the direction of material movement, a plurality of arcuate cylinder segments on each arbor, each segment extending axially of the arbor, means removably securing said arcuate cylinder segments on said arbors and enabling circumferential adjustment of the segments relative to the arbor, each respective segment having cutting lands thereon defining a cutting nip, said cutting lands on one arbor being offset from the cooperating cutting lands on the other arbor at the nip and being radially spaced from the cooperating lands on the other arbor at the nip and operable to rupture cut material moving through the nip, axially extending gaps being provided between segments on the arbors, each of said segments being adjustable circumferentially on the arbors relative to any other segments on the arbor, and the axially extending gaps on one arbor being circumferentially offset from the axially extending gaps on the other arbor at the cutting nip.

4,137,830
BOX METERING SYSTEM
Jerry L. Boyd, Bakersfield, Calif., assignor to Stanley A. McCluskey, Bakersfield, Calif.
Filed Oct. 7, 1977, Ser. No. 840,323
Int. Cl.[2] B31B *17/00*; B65B *57/02, 3/02*
U.S. Cl. 93—55 **8 Claims**

1. In combination with a box filling system in which a line of partially assembled two-piece boxes are advanced on a continuously moving conveyor to box filling stations, the provision of:

means to complete assembly of said two-piece boxes before reaching said filling station;

and means to meter the flow of said boxes along said line after assembly of said boxes is complete;



said box metering means including a switch means contacted by an incompletely assembled box to cause actuation of said box completion assembly means.

4,137,831

CLEAN AIR ZONE

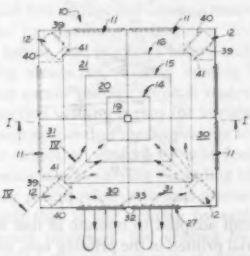
Frederick H. Howorth, Chorley, England, assignor to Howorth Air Engineering Limited, Lancashire, England

Continuation-in-part of Ser. No. 758,926, Jan. 13, 1977, Pat. No. 4,094,232. This application Apr. 8, 1977, Ser. No. 786,005

Claims priority, application United Kingdom, May 8, 1976, 19024/76

Int. Cl.[2] F24F *9/00*

U.S. Cl. 98—36 **2 Claims**



1. Apparatus for generating a clean air zone comprising: a rectangular housing having a plenum chamber and a lower face and perimetral lateral side walling including a plurality of side faces each having an air inlet therethrough, a filter below the inlets within the housing between the plenum chamber and lower face, a fan in each corner of the housing for drawing air from the surrounding area and through the inlets and into the plenum chamber, the lower face including a diffuser constituting an air delivery means having areas of different permeabilities for supplying air to the space therebeneath, the areas of different permeabilities being determined by differing numbers of apertures and/or differing sizes of apertures in the different areas, all adapted and arranged with air discharged through the air delivery means passing firstly through the areas of different permeabilities and downwardly into the corresponding spaces therebelow and secondly laterally outwardly and thirdly upwardly toward the inlets for sweeping a volume greater than the volume of the said spaces in the generation of a clean air zone having a perimeter outside the perimeter of the lower face.

4,137,832

WHISTLING COFFEE POT

Emanuel E. Lambros, 40-11th St., Wheeling, W. Va. 26003

Filed May 5, 1978, Ser. No. 903,039

Int. Cl.[2] A47J *31/00*

U.S. Cl. 99—285 **12 Claims**

1. A coffee maker comprising

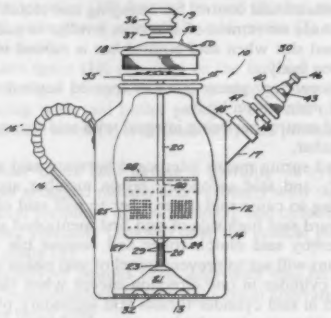
a pot having a closed bottom, a circumferentially continuous sidewall, and an open top,

a handle extending from the sidewall,

a spout extending from a portion of the side wall opposite the handle,

a lid for closing the open top, and including a dome of transparent material located centrally in the lid,

a tube supported by a hollow base, the tube being of a length such that when the tube base is disposed on the pot bottom, supporting the tube, the top of the tube extends into the dome of transparent material, and said tube having a basket supporting manifestation formed thereon,



a basket having a tubular central portion with a diameter only slightly greater than the tube diameter, and a perforated continuous side wall and a perforated bottom, and

whistle means disposed on said spout for indicating when boiling of water in said pot has been initiated by audibly releasing built-up steam from said pot.

4,137,833

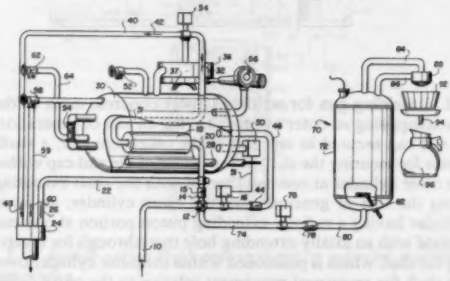
COMBINATION ESPRESSO AND AROMATIC COFFEE MAKER

Roni P. Yelloz, 65-04 161st St., New York, N.Y. 11365

Filed Jun. 17, 1977, Ser. No. 807,542

Int. Cl.[2] A47J *31/54*

U.S. Cl. 99—293 **3 Claims**



1. A coffee maker for making espresso as well as aromatic coffee comprising, a main tank, water supply means for feeding water to said main tank and maintaining water in said main tank to a predetermined level, a secondary tank operably receiving water from said water supply means positioned within said main tank and below said predetermined water level, a heating element within said main tank and spaced from said secondary tank for heating the water within said main tank to produce steam and for indirectly heating the water in said secondary tank, a pressure relief valve associated with said secondary tank for maintaining a predetermined pressure on water in said secondary tank, a conduit connected in series

with said secondary tank and extending partially within said main tank, an espresso group unit for containing espresso coffee grounds connected to said conduit, heated water from said secondary tank being directed through said conduit at constant temperature and pressure and to said espresso coffee group unit through the espresso coffee grounds therein to form espresso coffee, and a steam tap in said main tank above said water level therein for tapping steam from said main tank whereby water directed through the espresso coffee grounds to form espresso coffee is supplied at substantially constant temperature and pressure and steam may separatly be tapped from said main water tank to skoal milk in forming cappuccino.

4,137,834

COOKING AND MIXING DEVICE FOR HOUSEHOLD PURPOSES

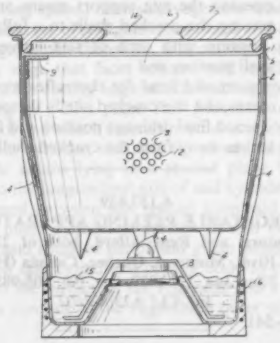
Paul-Ulrich Uíbel, Ennepetal, Fed. Rep. of Germany, assignor to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Sep. 30, 1976, Ser. No. 728,416

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1975, 7531236

Int. Cl.[2] A47J *27/00*

U.S. Cl. 99—348 **14 Claims**



1. In a device for heating and mixing foods, a combination comprising an upright bowl having an upright axis and including a circumferential wall, surrounding and a bottom wall substantially normal to said axis; means for heating the contents of said bowl; a mixing blade mounted for rotation in said bowl about said upright axis, so as to macerate foodstuffs admitted into said bowl; means for rotating said blade; and means for cooking the foodstuffs in said bowl without subjecting them to maceration by the rotating mixing blade, comprising a liquid-permeable basket insertable into said bowl above and out of contact with said blade and adapted to contain foodstuffs which are to come in contact only with liquid located in said bowl below said basket so that such liquid, when heated by said heating means and agitated by the rotating mixing blade, will contact the foodstuffs in the basket to cook such foodstuffs without maceration of the same.

4,137,835

OSCILLATORY FOOD WARMING APPARATUS

Ross K. Petersen, 2974 W. River Rd., Minneapolis, Minn. 55406

Filed Jan. 21, 1977, Ser. No. 761,065

Int. Cl.[2] A47J *27/10*; A23L *3/10*; A47J *36/24*

U.S. Cl. 99—348 **15 Claims**

1. An apparatus for warming and mixing the contents of a closed container, comprising:

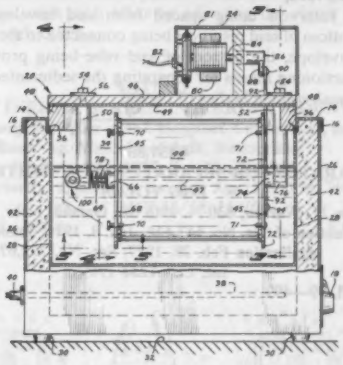
an open-top housing defining a chamber for receiving a heating fluid,

means for heating the fluid,

a substantially planar cover for closing the top of said housing,

container support means carried by and depending from said cover so as to be disposed within said chamber when said cover is on said housing,

said support means including spaced opposed container gripping members mounted for oscillation about an axis substantially parallel to the plane of said cover, said container being gripped therebetween such that it may be oscillated about said axis in said chamber to impart rela-



tive motion to the container contents and to oscillate portions of the container with respect to the heating fluid in heating the contents,

motor means mounted on said cover, and,

linkage means connected thereto and to said container gripping members for oscillating said members and a container gripped thereby.

4,137,836

APPARATUS FOR THE PRODUCTION OF CHEESE

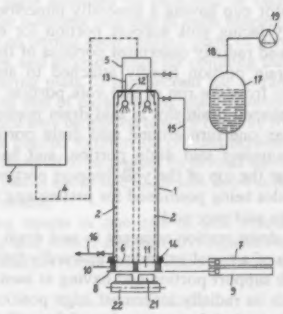
Pierre Megard, Nantua (Ain), France, assignor to Etablissements Chalon-Megard (Societe Anonyme), La Cluse (Ain), France

Filed Nov. 17, 1976, Ser. No. 742,453

Claims priority, application France, Nov. 18, 1975, 75 35744

Int. Cl.[2] A01J *11/06, 25/11*

U.S. Cl. 99—454 **3 Claims**



1. An apparatus for the production of cheese, comprising: at least one upright perforated tube adapted to receive a mixture of curd and whey and to permit the sedimentation of the curd in the whey within said perforated tube;

a nonperforated elongated upright envelope spacedly surrounding said tube over the entire length thereof and hermetically sealed to enable evacuation of the space between said tube and said envelope;

a reservoir of a size sufficient to collect said whey communi-

cating with said space and adapted to receive liquid from said space;

means for draining liquid from said reservoir; and

a suction pump connected to an upper portion of said reservoir whereby evacuation of said reservoir separates whey from said envelope into said reservoir and increases the relative density of the curd with respect to the whey in said tube,

said reservoir being spaced from said envelope and the bottom of said reservoir being connected to the top of said envelope, the bottom of said tube being provided with portioning means for separating the sedimented curd into equal-volume bodies of cheese.

4,137,837

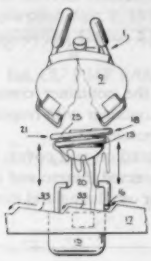
APPARATUS FOR SEPARATING EGG WHITES FROM EGG YOLKS

William H. Warren, 830 N. 89th St., Omaha, Nebr. 68114

Continuation of Ser. No. 647,444, Jan. 8, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 772,674

Int. Cl.[2] A23J *1/09*

U.S. Cl. 99—499 **3 Claims**



1. An egg separator for use on an automatic egg separating machine having means for mounting and for moving a plurality of the separators below egg breakers comprising the combination of:

an egg white receiving pan;

a separator cup;

means for positioning said separator cup at a position above said pan;

said separator cup having a generally imperforate concave upwardly facing yolk support portion for engaging the bottom and radially outermost portions of the yolk;

a white drain portion fixedly attached to and extending upwardly from the rim of said yolk portion;

a spirally shaped drain slot in said drain portion extending more than one turn around said drain portion, substantially encircling said drain portion, and having an end portion at the top of the yolk support portion;

said drain slot being positioned for passing egg white downwardly to said pan; and

said white drain portion adjacent to said drain slot being in the form of a sprial extending upwardly from the top of said yolk support portion and having at least the first full turn with its radially innermost edge positioned directly above the underlying outer edge of the yolk support portion for providing secondary support for the radially outermost portions of larger egg yolks.

4,137,838

MEANS FOR BREAKING AND SEPARATING EGGS

William H. Warren, 729 S. Main St., Centerville, Mass. 02632

Filed Dec. 29, 1976, Ser. No. 755,236

Int. Cl.[2] A23J *1/09;* **A47J** *43/14*

U.S. Cl. 99—500 **10 Claims**

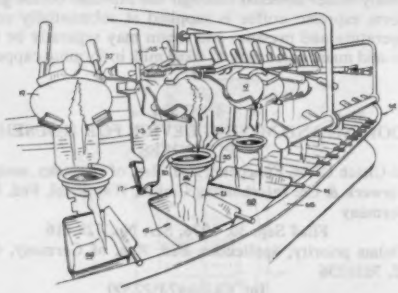
1. An improved egg cracking head for mounting on an endless conveyor on an egg cracking machine comprising the combination of:

means for mounting the cracking head on the conveyor;

knife means comprising a pair of knives moveably mounted on said cracking head for cracking the egg shells;

means for supporting an egg on said cracking head;

means for moving the knives into the egg to crack the egg shell;



means for opening the egg support means and the knives thereby moving the cracked shells to a fully opened egg draining position with each of said knives engaging a cracked shell portion; and

control means on said head for thereafter moving the egg support means and the cracked shells thereon to an only partially opened final drainage position and for withdrawing said knives away from the cracked shell portions.

4,137,839

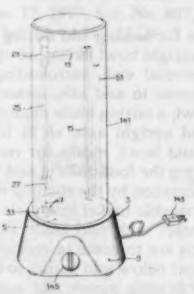
VEGETABLE PEELING APPARATUS

Fernand Couture, and René Allard, both of 2350 Edouard-Montpetit Blvd., Montreal, Quebec, Canada (H3T 1J4)

Filed Jun. 13, 1977, Ser. No. 805,985

Int. Cl.[2] A23N *7/02*

U.S. Cl. 99—541 **11 Claims**



1. In a mechanical machine for peeling vegetables and the like, said machine including

means for mounting a vegetable to be peeled;

means connected with said mounting means, operable for rotating a mounted vegetable about an axis of rotation;

a support arm;

means for mounting one end of said support arm, operable to move said support arm along an axis parallel with said axis of rotation, the other end of said support arm being engageable with a mounted vegetable; and

means resiliently urging said other end of said support arm toward a vegetable to be peeled, the improvement comprising:

a cutting head mounted on said other end of said support arm, said cutting head including:

an elongated body having, relative to the direction of rotation of a vegetable mounted in said machine for peeling, a leading end and a trailing end;

means mounting said elongated body to said other end of said support arm for pivotal movement about a pivotal axis lying parallel to said axis of rotation and extending transversely of said arm, said pivotal axis being located intermediate said leading and said trailing ends of said elongated body;

said elongated body including a first side surface disposed to face a vegetable mounted in said machine for peeling, said side surface extending from the region of said pivotal axis toward said leading end, and terminating at said leading end in guide means arranged to project outwardly from said side surface toward said vegetable, said guide means comprising at least one rounded ear, the tip of said rounded ear engaging the surface of said vegetable in point contact to sense the configuration thereof; and

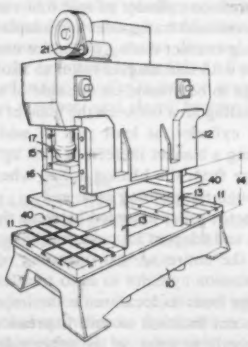
a cutting member secured to the trailing end of said elongated body, said cutting member including a hollow, generally cylindrical cutting body extending for a substantial distance in the direction of the longitudinal axis of the cylinder and arranged to project from said first side surface of said elongated body, the outer cylindrical surface of said cutting body engaging said vegetable, said first side surface being spaced from said vegetable when said tip of said rounded ear of said guide means and said cutting body are in engagement therewith, said cutting body including a cutting edge that faces toward said leading end, the portion of the cutting edge which first engages said vegatable lying in a first plane that generally includes said pivotal axis and which extends normal to said longitudinal axis of said cylinder, and said tip of said rounded ear of said guide means lying in a second plane that extends parallel to the longitudinal axis of said cylinder and which is positioned between and spaced from said pivotal axis and said outer cylindrical surface of said cutting body, whereby said rounded ear of said guide means is effective to position said cylindrical cutting body to cut generally parallel to the surface of the vegetable and to follow any change in contour of the vegetable's outer surface.

4,137,840

MECHANICAL PRESS HAVING TWIN WORKING STATIONS

Ichiro Kubota, Asaka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 10, 1978, Ser. No. 876,832
Claims priority, application Japan, Feb. 9, 1977, 52-12407
Int. Cl.[2] B30B *15/12*
U.S. Cl. 100—209 **4 Claims**



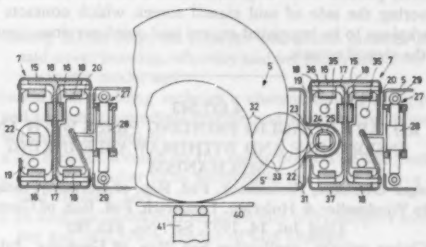
1. A mechanical press having twin working stations comprising a bed, a pair of bolsters mounted on both side ends of said bed, respectively, four column means extending upwardly from said bed, frame means mounted on said column means, said frame means having a pair of guide portions defined at both ends thereof, a pair of slide means slidably mounted in the respective guide portions of said frame means, each of said slide means being adapted to face with each of said bolsters, drive means mounted on said frame means, and transmission means operatively connecting said drive means with said pair of slide means, said transmission means including a pair of clutch means wherein stroke phases of said pair of slide means can be varied with each other by adjusting the clutch means relative to each other.

4,137,841

LOW INERTIA SCREEN INTERRUPT MOUNT

Heinrich Voegelin, Wiler near Utzenstorf, Switzerland, assignor to Fritz Buser Ag. Maschinenfabrik, Switzerland

Filed Apr. 11, 1977, Ser. No. 786,362
Claims priority, application Sweden, Apr. 12, 1976, 764617
Int. Cl.[2] B41F *15/38, 15/10*
U.S. Cl. 101—128.1 **5 Claims**



1. A rotary screen process printing press having at least one printing station comprising

a machine frame;

a conveyor belt supported on said frame for carrying material to be printed;

said station having first and second transverse bars fixedly secured to said frame above said belt, said first bar having a driving shaft rotatably mounted therein to rotate about the longitudinal axis of said shaft;

a cylindrical stencil provided between said first and second bars;

a bearing plate mounted on each end of said stencil, first means for coupling one end of each bearing plate to said first bar to permit each bearing plate to pivot about said shaft axis, and second means for coupling the other end of each bearing plate to said second bar to raise and lower said other end of each bearing plate selectively whereby said stencil may be moved toward or away from the material to be printed to interrupt contact between said stencil and the material to be printed by pivotal movement of said bearing plates about said shaft axis upon actuation of said second means;

and driving means in one end of said bearing plates for coupling said stencil and said driving shaft to permit said driving shaft to rotate said stencil synchronously with said belt.

4,137,842

METHOD AND APPARATUS FOR APPLYING DECORATIVE IMPRINTS TO THE SURFACES OF PLASTIC WORKPIECES

Henry L. Miller, Mars, Pa., assignor to Miller Screen & Design, Inc., Mars, Pa.

Filed Mar. 2, 1977, Ser. No. 773,393
Int. Cl.[2] B41N *1/24*
U.S. Cl. 101—128.3 **4 Claims**

1. In the method of applying decorative imprints to the surfaces of plastic workpieces, the steps of:

photographically forming on stencil screen a paint-impervious layer having a paint-pervious opening therein defining a desired pattern to be imprinted,

securing to a frame said stencil screen,

coating the side of said stencil screen which contacts a workpiece with a silicone release agent such that all areas of said side are covered,

passing a solvent through the areas of the screen forming said paint-pervious opening to remove therefrom at least the major part of the coating of silicon release agent, and thereafter permitting said solvent to evaporate and said silicon release agent to cure, and

contacting the surface of a plastic workpiece with the coating of silicon release agent to transfer paint forced through the paint-pervious openings in the screen onto the surface of a plastic workpiece.

4. In combination, a stencil screen frame, a stencil screen secured to one side of said frame, a paint-impervious layer on said screen having a paint-pervious opening therein defining a desired pattern to be imprinted, and a silicone release agent covering the side of said stencil screen which contacts said workpiece to be imprinted except said paint-pervious opening in the stencil screen.

4,137,843

ROTARY INTAGLIO PRINTING PRESS WITH AN INSERTABLE AND WITHDRAWABLE INKING MECHANISM

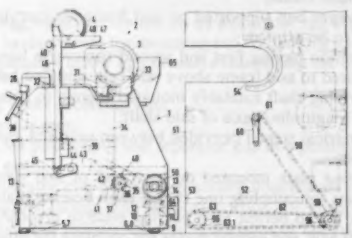
Ludger Ottenhue, Riesenbeck, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jul. 14, 1977, Ser. No. 815,781

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1976, 2632455

Int. Cl.[2] B41F *9/18, 13/44*

U.S. Cl. 101—153 **8 Claims**



1. An apparatus for inserting and removing from a rotary intaglio printing press an inking mechanism having a plate cylinder, an impression cylinder, and an ink trough, the apparatus being positionable so that the inserting and removing is in a direction transverse to the axis of the plate cylinder, said apparatus comprising:

a movable carriage;

support means carried by said carriage for supporting the inking mechanism;

movement means operatively associated with said support means for raising said support means to insert the inking mechanism and for lowering said support means to remove the inking mechanism;

a pair of front wheels and a pair of back wheels for supporting said carriage;

mounting means for interconnecting said front and said back wheels and said movable carriage including:

steering pin means including steering pins for interconnecting said front and said back wheels and said movable carriage, and

guide rollers for guiding movement of said movable carriage with respect to the rotary intaglio printing press, the rotary intaglio printing press having guide means for cooperating with said guide rollers; and

manual steering means for positioning said front and said back wheels in predetermined positions prior to movement of said movable carriage.

4,137,844

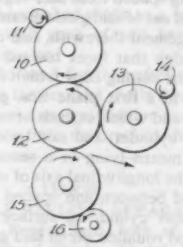
PERFECTOR PRINTER PRESS

Harold E. Paulson, 5369 Vernon Lake Dr., Dunwoody, Ga. 30338

Continuation-in-part of Ser. No. 749,039, Dec. 9, 1976, abandoned. This application Jul. 1, 1977, Ser. No. 812,053

Int. Cl.[2] B41F *5/12, 7/12*

U.S. Cl. 101—218 **5 Claims**



1. A perfector printing press comprising:

a frame having generally parallel opposite sides;

a blanket roller mounted between said frame sides and having a first circumference;

at least one plate cylinder and ink supply system mounted between said frame sides, adapted to make continuous rolling contact during the entire normal operation of the press with said blanket cylinder, said plate cylinder having said first circumference and plate means thereon adapted to produce alternate direct printing and transfer printing images;

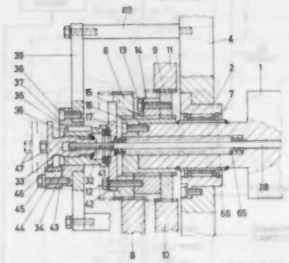
an impression cylinder of said first circumference mounted between said frame sides and adapted to make continuous rolling contact during the entire normal operation of the press with said blanket roller to allow said direct printing image to be printed on one side of stock passing through a printing area between the blanket roller and the impression cylinder, at least part of said impression cylinder having a blanket thereon to pick up said transfer printing image from the blanket roller when no stock is passing through the printing area; and

a perfector roller mounted between the frame sides in bearings and adapted to make continuous rolling contact during the entire normal operation of the press with said impression cylinder so as to transfer the transfer printing image from its location on the impression cylinder to an adjacent location on said impression cylinder positioned correctly to print on the other side of the stock passing through the printing area, said bearings carried in a mounting yoke which surrounds the rotational axis of the impression cylinder so as to permit movement of said perfector roller about the rotational axis of said impression roller in contact therwith.

4,137,845
DEVICE FOR ADJUSTING LATERAL AND CIRCUMFERENTIAL REGISTER IN ROTARY PRINTING MACHINES

Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,272
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 2705522
Int. Cl.[2] B41F *13/14*
U.S. Cl. 101—248 6 Claims



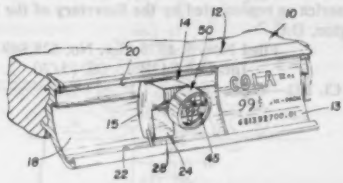
1. Device for adjusting circumferential and lateral register in a rotary printing machine having a support framework with respective frames at mutually opposite drive and operating sides of the machine and a plate cylinder drivable by a straight-toothed spur gear located at the drive side of the machine, comprising first and second adjusting means disposed on the operating side of the machine, respectively, for turning the plate cylinder radially relative to the spur gear for driving the plate cylinder so as to adjust the circumferential register and for axially displacing the plate cylinder so as to adjust the lateral register, an adjusting spindle extending axially through a bore formed in the plate cylinder, said adjusting spindle being coupled at the operating side of the machine to said first adjusting means and being connected, at the drive side of the machine, to a threaded member, a thrust bearing operatively associated with said threaded member and with the spur gear driving the plate cylinder, the spur gear being carried by a coupling having helical coupling surfaces and being displaceable axially on said coupling relative to the plate cylinder by said first adjusting means through said adjusting spindle, said threaded member and said thrust bearing, a rotatable threaded bushing coupled to said second adjusting means at the operating side of the machine, means for axially displacing the plate cylinder together with said adjusting spindle and the spur gear upon rotation of said threaded bushing by said second adjusting means, and compression spring means disposed between the plate cylinder and the spur gear for applying a force transmissible through said adjusting spindle, as tension member, and through said threaded member, said thrust bearing and said threaded bushing.

4,137,846
PRICE-MARKING STAMP DEVICE

Conrad Rossebo, 25211 Stockport, Laguna Hills, Calif. 92653

Filed Aug. 3, 1977, Ser. No. 821,466
Int. Cl.[2] B41J *1/58, 1/08*
U.S. Cl. 101—379 3 Claims

1. A price-marking device for use in conjunction with molding affixed to storage shelves, wherein the device comprises:
- a main body-support member to be removably mounted to said molding;
- mounting means formed on said main body to engage said molding in a locked position;
- ink-pad-holder movably attached to said body-support member;
- ball-joint member connected between said body-support member and said ink-pad-holder means;
- an ink pad removably mounted in said ink-pad-holder means, said ink pad having indicia means formed thereon for engagement with items to be price-marked, wherein said ink-pad-holder means comprises:
  - an annular piston member having a cavity disposed therein to removably receive said ink pad therein,
  - a cover housing slidably mounted over said piston member, and

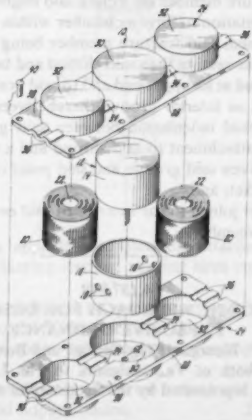


- biasing means disposed between said piston member and said cover housing, whereby said ink pad is protected in a non-use mode; and
- wherein said molding includes a channel having an upper and a lower longitudinal groove, and wherein said mounting means comprises:
  - a lip member formed on the upper portion of said body-support member to be received in the upper groove of said channel, and
  - a locking bar positioned between said body-support member and said lower groove of said channel.

4,137,847
GAS GENERATOR

Turner E. Osborne, Bellbrook, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1977, Ser. No. 845,880
Int. Cl.[2] F42B *3/04*
U.S. Cl. 102—39 3 Claims



1. A gas generator comprising, in combination, an annular combustion chamber, a number of annular cooling and filtering means located in radially spaced relationship to each other and to the annular combustion chamber, an outer housing having a first cup shaped annular portion encapsulating the annular combustion chamber and a number of other spaced annular portions, each respectively encapsulating an annular filtering and cooling means, continuous flange means joining the annular portions of the housing with each other, first flow passage

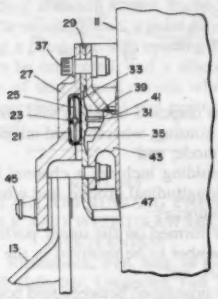
means provided by the continuous flange means interconnecting the first annular portion of the housing with each of the other annular portions thereof, and second flow passage means provided by the continuous flange means interconnecting each of the other annular portions of the housing and an article to be inflated.

4,137,848

ROCKET ENGINE MOUNT

Daniel Cunha, Mt. View, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 5, 1975, Ser. No. 628,869
Int. Cl.[2] F42B *15/00, 15/20*
U.S. Cl. 102—49.5 **7 Claims**



1. A system for mounting an engine within a missile comprising:
   (a) a hollow tube to encircle said engine;
   (b) an explosive contained in said tube;
   (c) a shroud joined to said missile, said shroud encircling said engine and having an identation at its interior to contain said tube therein;
   (d) a fracture member joined in the interior of said shroud, said fracture member encircling said engine and enclosing said indentation to form a chamber within which said tube is contained, said fracture member being of lesser transverse cross-section than said shroud and being attached to said shroud at its upper end and to said bracket at its lower end with an interior groove therebetween, and having a first internal indentation between said groove and said point of attachment to said shroud and a second indentation between said groove and said point of attachment to said bracket; and
   (e) a bracket joined to the exterior of said engine and to said fracture member.

4,137,849

ENDOTHERMIC APPROACH FOR DESENSITIZING EXPLOSIVE ORDNANCE

Christopher P. Hontgas, King George, and Benjamin D. Smith, Dahlgren, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 25, 1977, Ser. No. 844,688
Int. Cl.[2] F42B *37/00*
U.S. Cl. 102—56 R **5 Claims**

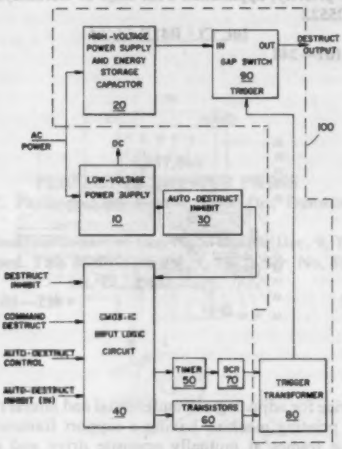
1. A bomb liner intermediate a bomb case and an explosive, which comprises:
   a polyvinyl-chloride resin based plastisol matrix support material; and
   a desensitizing agent s-trithiane, which is compatible and admixed with said matrix support material and capable of endothermically reacting with said explosive.

4,137,850

DESTRUCT INITIATION UNIT

Egon F. Donner, Los Gatos, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 11, 1977, Ser. No. 840,937
Int. Cl.[2] F42C *11/00*
U.S. Cl. 102—215 **17 Claims**



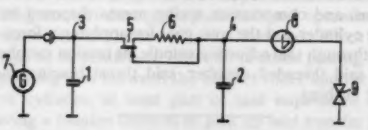
1. An improved destruct initiation unit having a high voltage potential source connected to a detonator by a gap switch which initiates said detonator upon receiving a destruct signal, the improvement comprising:
   (a) means for delaying execution of said destruct signal to allow for determination of the source of said destruct signal before said detonator is initiated; and
   (b) means for immunizing said destruct initiation unit from noise to prevent a false destruct signal from initiating said detonator.

4,137,851

ELECTRONIC IGNITION CIRCUIT

Peter F. Weidner, Breitenbrunn, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nüremberg, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 849,267
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653517
Int. Cl.[2] F42C *11/06*
U.S. Cl. 102—218 **6 Claims**



1. In an electronic ignition circuit for the self-destruction of a projectile fuse, including a voltage source, a charging condenser for determining the time interval for self-destruction, a threshold switch actuatable upon a predetermined minimum voltage being reached at the voltage potential pole of said charging condenser so as to ignite an igniter; and an electronic control circuit being connected intermediate the voltage potential pole of said voltage source and the voltage potential pole of said charging condenser, the improvement comprising: said electronic control circuit being connected in said ignition circuit to provide a constant current source for maintaining the recharging current flowing from said voltage source to said

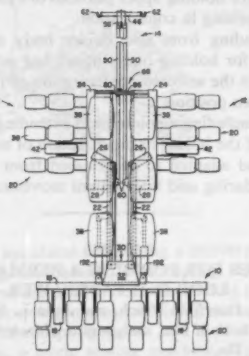
charging condenser and to said threshold switch essentially constant independently of the drop in the differential voltage between said voltage potential poles during charging.

4,137,852

FORWARDLY FOLDABLE TOOLBAR

Ronald L. Pratt, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed Sep. 3, 1976, Ser. No. 720,270
Int. Cl.[2] A01B *65/02;* B62D *21/14*
U.S. Cl. 111—57 **48 Claims**



1. A forwardly folding agricultural implement comprising: a central transverse horizontal frame having ground wheels thereon; a pair of horizontal outer frames; tools supported on the central and outer frames; and projecting rearwardly therefrom when in working position; vertical pivot means carried by the central frame inwardly of its outer ends at distances with respect to the outer ends substantially equal to a major portion of the rearward expanse of the tools on the outer frames when they are in their working position; means connecting the outer frames with the pivot means for movement between a first fowardly folded position in which the major portions of said tools on the respective outer frames are within the transverse expanse of the central frame and a second transversely extending position; powered folding means between the central and outer frames for moving the latter between their first and second positions; locking means between the central and outer frames for securing the latter in their second position; and hitch means adapted for connection to and support by a tractor and including a pair of drawbar links extending in diverging relation from forward ends joined together to rear ends connected to respective outer frames outwardly of the vertical pivot means.

4,137,853

FOLDING GRAIN DRILL DRIVE INCLUDING SEED DISPENSING CLUTCH ACTUATED BY TENSIONING PULLY ON GROUND DRIVE

Harley G. Peterson, Rte. 1, Salina, Kans. 67401

Filed Aug. 22, 1977, Ser. No. 826,960
Int. Cl.[2] A01C *7/00;* A01B *33/08*
U.S. Cl. 111—67 **8 Claims**

1. A grain drill drive for use on a drill having the depth gauging wheels with drive sprockets thereon carried on pivoting legs attached to the frame and the grain box having a seed shaft for dispensing the seed, the drive comprising:

a clutch shaft rotatably journaled on the frame with its axis offset from the axis of the pivoting legs;

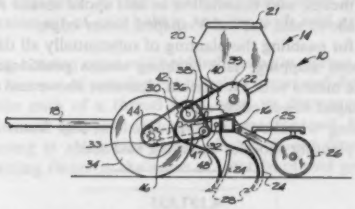
a first sprocket and chain means on the clutch shaft driving the seed shaft;

a second sprocket and chain means on the clutch shaft driven by the gauge wheel sprocket;

an idler arm which is pivotally mounted at one end on the frame, an idler pulley mounted on the opposite end of the arm, the pulley engaging the second chain means, biasing means urging the idler arm in a direction tensioning the second chain means;

rotating cam means attached to the pivoting end of the idler arm;

clutch means on the clutch shaft between the first and second sprocket and chain means including a rocker arm with



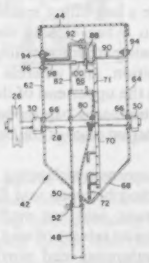
a cam follower at one end engaging the cam means and a clutch disengaging means at the opposite end of the rocker arm; the axis of the clutch shaft being positioned on the frame relative to the gauge wheel axis and the pivoting leg axis so that rotation of the pivoting leg causes the distance between the gauge wheel axis and clutch shaft axis to increase and thereby cause the idler arm to rotate and disengage the clutch means so that the said seed shaft stops turning.

4,137,854

PLANTING APPARATUS INCLUDING SPRING FOR VIBRATION OF PICKUP SPOKES

Michael E. Lattin, P.O. Box 447, Natalia, Tex. 78059

Filed Dec. 23, 1976, Ser. No. 754,079
Int. Cl.[2] A01C *7/04*
U.S. Cl. 111—77 **2 Claims**



1. A planting apparatus adapted for attachment to farm machinery for planting seeds of varying sizes comprising:

a frame;

hopper means mounted on said frame, said hopper means having a curved V-shaped lower edge;

a planting shoe connected to and extending downward from said frame;

flue means extending upward from behind said planting shoe to inside said hopper means;

axial means pivotally mounted on said frame, said axial means extending inside said hopper means;

drive means connected to said axial means for turning said axial means upon movement of said planting apparatus;

a pickup wheel inside said hopper means, said pickup wheel turning with said axial means;

interchangeable spoke means extending radially outward from said pickup wheel, each said spoke means having in its leading edge, an indentation constructed and arranged to receive a seed therein upon rotation of said spoke means

into seeds in said hopper means, said indentation being slightly larger than said seeds being planted so that only one of said seeds may be contained within said indentation; a spring fastened at one end by bracket means to said hopper and positioned so that the free end of said spring extends into said pickup wheel, upon rotation of said spokes said spring striking said spokes to vibrate said seeds from said indentations and into an opening in said flue, said seed being dropped behind said planting shoe via said flue means, said indentation in said spoke means rotating just above said curved V-shaped lower edge;

means for enabling the planting of substantially all the seeds without skipping, said enabling means positioning said spoke means with a minimum clearance above said curved V-shaped lower edge; and

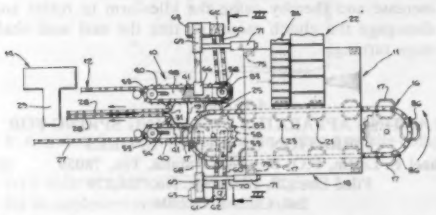
a planting wheel rotatably mounted on said frame behind said planting shoe for covering said seed.

4,137,855

TRANSFER MEANS FOR A PLIANT BAG HAVING CONTENTS THEREIN

Stanley A. McClusky, Box 188, Edison, Calif. 93220

Filed Jun. 20, 1977, Ser. No. 808,283
Int. Cl.[2] D05B *13/02*
U.S. Cl. 112—11 **13 Claims**



1. In a device for transferring filled pliant flexible bags of discrete articles from a bag filling machine having bag holders moving in a path to a bag closing means and sewing head means spaced from said path for stitching the top portion of the bag into closed position, and wherein a filled bag is moved along said path with the upper end of the bag secured on a bag holder in open position, said bag having pliant walls and extending above the bottom edge of the bag holder, the provision of:

bag wall support means overlapping an end portion of said path and extending between said filling machine and said bag closing means, said bag wall support means being engageable, prior to release of said bag by said bag holder and at said overlapping end portion of said path, with upper pliant bag wall portions in open position below and adjacent the bottom edge of the bag holder on opposite sides of the bag for holding and guiding said upper bag wall portions after release by said bag holder into a position for engagement with said bag closing means for transport to the sewing head means.

6. An adjustable apparatus for positioning between adjacent spaced ends of transport means for filled pliant bags to transfer a filled upright pliant bag from one transport means to the other transport means, comprising:

a pair of frame structures, each structure including

a first frame member adjustably connected to a transport means for longitudinally positioning said frame member relative to said transport means,

a second frame member transverse to said first frame member and adjustably connected to said first frame member for lateral positioning of said frame structure relative to said transport means;

an endless flexible member supported from said second frame member and having an inboard lay parallel to and opposite to the inboard lay of the flexible member supported by the other frame structure;

engagement means carried by said endless flexible member to engage upper pliant bag portions while said filled bag is supported by one transport means before transfer to the other transport means;

and drive means on each of said frame structures for said endless flexible members carried thereby for moving said inboard lays at substantially the same speed as the transport speed of a filled bag.

13. A bag holder adapted to be moved intermittently in a selected direction and having a hollow holder body of selected configuration for holding upper portions of a pliant bag in open position, comprising in combination:

means extending from said holder body in said selected direction for holding pliant upper bag portions not conforming to the selected configuration of the holder body in bag open position,

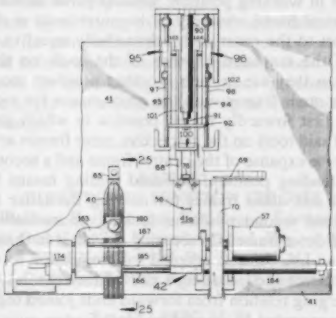
said means including a pointed rod extending from a bottom portion of the holder in the direction of movement of the holder and adapted to be released from said pliant bag portions during said intermittent movement.

4,137,856

APPARATUS FOR FORMING A PERMANENT END LOOP IN A FABRIC WEB

Frank Brauns, Deerfield Beach, and John L. Sullivan, Jr., Ft. Lauderdale, both of Fla., assignors to Novatronics, Inc., Pompano Beach, Fla.

Filed Oct. 11, 1977, Ser. No. 840,561
Int. Cl.[2] D05B *3/12*
U.S. Cl. 112—104 **40 Claims**



1. In an apparatus for forming a sewn loop on one end of an elongated, flexible fabric web, the combination of:

a support table having a horizontal, web supporting top surface;

means for advancing the web lengthwise along a predetermined path across the table;

means for folding the leading end of the web back over a trailing part of the web;

a transfer device mounted above the table for adjustment transversely of said path of the web between a retracted position adjacent a sewing machine at one side of the web and an extended position overlying the folded-over leading end of the web;

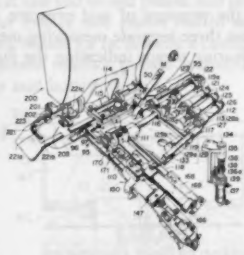
and means for moving said transfer device to said extended position when the leading end of the web is folded over and for actuating said transfer device to engage the folded-over web from above and thereafter for moving said transfer device transversely to said retracted position to slide the web transversely across the table to a position to be sewn by the sewing machine.

4,137,857

BELT LOOPER APPARATUS

Nobuji Miyachi; Keniti Miyake, both of Kyoto, and Akira Ogawa, Uji, all of Japan, assignors to Miyachi Sewing Machine Co., Ltd., Kyoto, Japan

Filed Aug. 26, 1977, Ser. No. 827,956
Claims priority, application Japan, Sep. 10, 1976, 51-109209; Sep. 10, 1976, 51-109210; Apr. 27, 1977, 52-49469
Int. Cl.[2] D05B *3/12*
U.S. Cl. 112—121.27 19 Claims



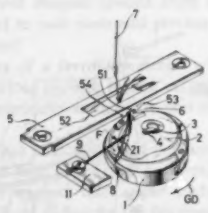
1. A belt looper apparatus comprising a delivery means for delivering an elongated material, an accepting means for accepting the delivered material, a cutter for cutting the material secured on said accepting means, a folding means which is located between the accepting means and the cutter and includes two fingers, a cycle sewing machine, a guide upon which said accepting means and said folding means are mounted to move sideways toward the sewing machine, a garment-pressing means mounted on the cycle sewing machine and having a garment presser, said guide and said garment presser being movable in a direction equivalent to that of the delivery of the material, and a slackening means, the accepting means and the folding means being rotatable slightly by a groove formed on a vertical plate of the guide and an eccentric shaft associated with the groove, whereby the under surface of the accepting means contacts the garment.

4,137,858

GRIPPER AND BOBBIN ASSEMBLY FOR DOUBLE-LOCK-STITCH SEWING MACHINE

Wilhelm Stapel, Bünde; Günter Droste, Leopöldshohe, and Klaus-Dieter Seiler, Kirchlengern, all of Fed. Rep. of Germany, assignors to Durkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed Apr. 15, 1977, Ser. No. 788,025
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616738
Int. Cl.[2] D05B *57/14*
U.S. Cl. 112—181 6 Claims



1. A bobbin and gripper assembly for a double-lock-stitch sewing machine which comprises:

a horizontal stitch plate traversed by the sewing machine needle and adapted to carry a needle thread through said stitch plate;

a gripper rotatably mounted below said stitch plate for rotation in a horizontal plane for engagement with said needle thread to form a loop and engage said loop with a lower thread;

a bobbin housing received in said gripper and rotatable relatively thereto, said bobbin housing receiving a bobbin for feeding said lower thread; and

retaining means for restricting rotation of said bobbin housing relative to said gripper said retaining means including:

a retaining finger formed on said bobbin housing,

an abutment formed on the underside of said stitch plate and engagable by said retaining finger upon angular entrainment of said bobbin housing with said gripper, and

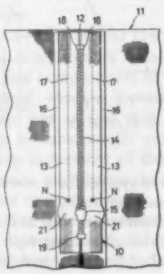
a spring bearing upon said bobbin housing in a sense opposite its sense of entrainment by said gripper and disposed in the path of a thread loop upon its disengagement from said gripper, said spring engaging said bobbin housing at a location ahead of and spaced from said retaining finger in the sense of rotation of said gripper.

4,137,859

SLIDE FASTENER AND A METHOD OF ATTACHING THE SAME TO A GARMENT

Kenichiro Itoh, Juegesheim, Fed. Rep. of Germany, assignor to Yoshida Kogyo K K, Tokyo, Japan

Filed May 11, 1977, Ser. No. 795,858
Claims priority, application Japan, May 15, 1976, 51-55663
Int. Cl.[2] D05B *3/12*
U.S. Cl. 112—265 2 Claims



1. A method of attaching a slide fastener to a garment having a slotted closure opening of a given length, which method comprises the steps of;

(a) coupling together a pair of stringer tapes each carrying a row of fastener elements extending from a lower end to an upper end on and along its confronting longitudinal edge, said stringer tapes being longer than the closure opening;

(b) mounting a slider onto said already coupled rows of fastener elements at their lower ends, said rows of fastener elements being interengaged over their entire lengths except for a region of disengagement resulting from the placement of the slider and located thereat to thereby establish said coupled stringer tapes in a predetermined positional relation to each other;

(c) turning said garment inside out;

(d) placing said coupled stringer teapes onto said garment in such a manner that the outer surfaces of said coupled stringer tapes are mated with opposed inner marginal portions of the closure opening, with said coupled rows of fastener elements in alignment with the closure opening, and with said slider disposed downwardly of the lower end of the closure opening;

(e) sewing said coupled stringer tapes respectively to said opposed inner marginal portions by lines of stitching simultaneously except at the lower portions thereof extending downwardly of the lower end of the closure opening were said slider is positioned; and

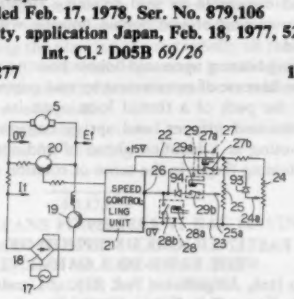
(f) moving said slider upwardly beyond the lower end of the closure opening.

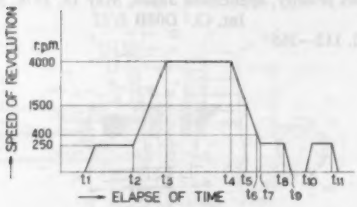
4,137,860

ELECTRICAL DRIVE SYSTEM FOR A SEWING MACHINE

Satoshige Yoneji; Yoshiharu Higuchi, and Shushin Mori, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 17, 1978, Ser. No. 879,106
Claims priority, application Japan, Feb. 18, 1977, 52-17432
Int. Cl.[2] D05B *59/26*
U.S. Cl. 112—277 **15 Claims**





1. An electrical drive system for a sewing machine having a drive shaft, the system comprising:

a motor drivingly connected with said drive shaft,

a speed control circuit connected with said motor for controlling the speed of the same and including a low speed setting circuit;

an electrical braking circuit provided within said speed control circuit for electrically braking said motor upon a deceleration command coming thereoutside;

electromechanical braking means for frictionally braking a rotating member driven by said motor;

first control means for effecting said electromechanical braking means for a predetermined period during a deceleration period from the normal running speed to said low speed controlled by said low speed setting circuit; and

second control means for effecting both or either of said electrical braking circuit and said electromechanical braking means upon a stopping command generated in the low speed condition of said motor.

4,137,861

PROCESS FOR MOORING A SHIP AND A FENDER ARRANGEMENT FOR SUCH MOORING PROCESS

Irving Brummenaes, 9 Nedstrandgaten, 5500 Haugesund, Norway

Continuation-in-part of Ser. No. 589,140, Jun. 23, 1975, abandoned. This application Apr. 22, 1977, Ser. No. 790,122
Claims priority, application Norway, Jun. 26, 1974, 742313/74
Int. Cl.[2] B63B *59/02*
U.S. Cl. 114—219 **6 Claims**

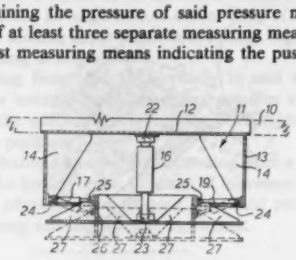
1. In a process of mooring a ship at a ship terminal, using at least two fenders to damp push forces transmitted from the ship to said ship terminal, including hauling the ship towards the ship terminal with a hauling tension provided in a number of hawsers by means of associated mooring winches, the steps of:

(a) simultaneously exerting a controlled nominal hauling tension in each hawser to provide a nominal minimum push force from the ship towards said ship terminal via said fenders,

(b) damping said push forces by means of a fluid pressure medium in each fender,

(c) relieving said pressure medium in said fenders when the pressures thereof exceed predetermined respective pressures,

(d) determining the pressure of said pressure medium by means of at least three separate measuring means, including a first measuring means indicating the pushing force



acting between the ships hull and the jetty, a second measuring means indicating the force acting between the ships hull and the fender longitudinally of the ship and a third measuring means indicating the force acting between the ships hull and the fender vertically of the ship, and

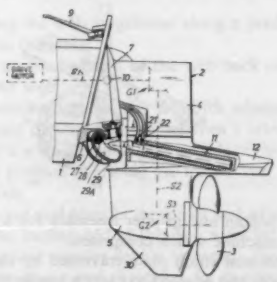
(e) regulating the hauling tension in each hawser in relation to the pressures indicated in said first, second and third measuring means in order to provide a minimum frictional resistance between the ship's hull and each of said fenders, said minimum resistance being regulated such that a controlled vertical movement of the ship's hull in relation to the fenders is allowed, whereas movement of the ship's hull longitudinally of the ship in relation to the fenders is prevented.

4,137,862

LIFT CONTROL DEVICE FOR PROPELLER DRIVE SYSTEMS ON WATERCRAFTS

Heinz Niederste-Hollenberg, Gauting; Christoph Sacher; Friedrich Fickenscher, both of Munich, and Johann Eichinger, Putzbrunn, all of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen-und Zahnradfabrik, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1977, Ser. No. 778,151
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612564; Nov. 6, 1976, 2650879
Int. Cl.[2] B63H *5/12*
U.S. Cl. 115—41 HT **9 Claims**



1. In a lifting device for use with a Z-drive arrangement for watercrafts having a drive motor and a propeller and a trans-

mission shaft arrangement which extends from said drive motor below the water level to said propeller, said transmission shaft arrangement being positioned in a housing mounted for a pivotal movement relative to said watercraft about a substantially horizontal axis and at least one power lift cylinder for effecting a driven movement of said housing about said horizontal axis, the improvement comprising wherein said lift cylinder is fixedly secured to said housing for movement therewith and against movement with respect thereto, said lift cylinder having a piston reciprocally mounted therein and a piston rod secured at one end to said piston, and pivot means connecting the other end of said piston rod to said watercraft, and compensating means for facilitating a change in the location of said pivot means relative to said watercraft as said housing pivots about said horizontal axis.

4,137,863

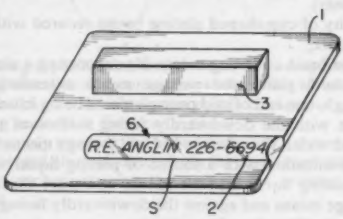
READING INSTRUMENT

Russell E. Anglin, 6157 Cottle Rd., San Jose, Calif. 95123

Filed Apr. 12, 1977, Ser. No. 786,796

Int. Cl.[2] B41J *11/64;* **B42D** *9/00;* **G02B** *27/02*

U.S. Cl. 116—306 **5 Claims**



1. A reading instrument for magnifying certain, selected printed material on the upper surface of a sheet of paper and for visually isolating said certain material from other, adjacent printed material on said upper surface, the instrument comprising:

a magnifying assembly including

an elongated, plano-convex lens means formed from a half round rod of a lens quality substance,

a flat, non-ferrous, opaque plate provided with an elongated slot,

means for attaching said lens means to said plate in alignment with said slot so that any printed material seen through said slot is magnified by said lens means, and

a permanent magnet spaced from said lens means and attached to said plate and serving as a handle for said plate; and

a flat lamina of a ferrous material which is operationally disposed close enough to said magnifying assembly so as to be magnetically attracted to said magnet to a substantial degree;

whereby when said lamina is positioned beneath a lower surface of said paper and said magnifying assembly is positioned against said upper surface, the assembly is inhibited from sliding by the frictional force between said assembly and said paper caused by the weight of said assembly and by the magnetic attraction between said assembly and said lamina, and where certain printed material on said upper surface may be magnified and isolated from other printed material on said upper surface by grasping said magnet and positioning said slot and said lens over said certain, selected material.

4,137,864

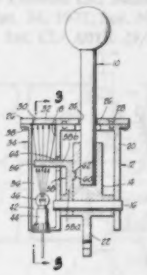
ILLUMINATED POSITION INDICATOR FOR A CONTROL SHIFT LEVER

Warner R. Lauper, San Pedro, Calif., assignor to Quadrastat Controls Corporation, Glendale, Calif.

Continuation-in-part of Ser. No. 731,634, Oct. 12, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,920

Int. Cl.[2] G09F *9/00*

U.S. Cl. 116—28.1 **17 Claims**



1. An illuminated indicator for selectively indicating the respective operative positions of a movably mounted shift lever, comprising:

(a) a bracket mounting said shift lever for selective swinging movements about an axis of rotation to its respective operative positions;

(b) wall means at one side of said bracket providing a substantially closed compartment adjacent one end of said axis of rotation, said compartment having one wall formed with an elongated window opening facing generally towards the outer end of said shift lever and having its longitudinal axis in substantially parallel relation to the plane of swinging movement of the shift lever, and another wall between said compartment and said bracket having an arcuate opening therein;

(c) an elongated dial of light transmitting material positioned in said window opening, said dial having longitudinally spaced indicia thereon corresponding to the respective positions of the shift lever;

(d) a light source within said compartment fixedly mounted on a wall opposite said dial providing a general illumination of said dial and the indicia thereon;

(e) optical means within said compartment positioned between said light source and said dial for concentrating a portion of the rays from said source into a beam of a size to provide a distinguishing spot illumination of a single indicium; and

(f) a support for said optical means extending through said arcuate opening and being connected to said lever so as to shift said optical means and said distinguishing spot illumination from one indicium to another in accordance with the respective positions of said shift lever.

4,137,865

MOLECULAR BEAM APPARATUS FOR PROCESSING A PLURALITY OF SUBSTRATES

Alfred Y. Cho, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1976, Ser. No. 755,663

Int. Cl.[2] C23C *13/08*

U.S. Cl. 118—49.1 **3 Claims**

1. Apparatus for the molecular beam deposition of semiconductor material sequentially on a plurality of substrates comprising:

an evacuable growth chamber;

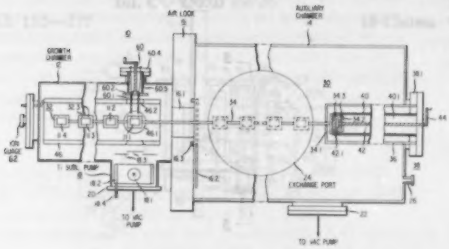
an evacuable auxiliary chamber;

gate means for alternately placing said chambers in commu-

nication with one another and for isolating said chambers from one another;

means for generating at least one molecular beam directed to a growth position within said growth chamber;

retractable means extendable from the exterior of said apparatus through said auxiliary chamber and into said growth chamber for sequentially moving said substrates to said growth position for a time period effective to deposit thereon layers of said material of the desired thickness; CHARACTERIZED IN THAT:



said growth chamber includes:

means for selectively heating said substrates so that only the substrate in said growth position (the growth substrate) is heated at any one time, the other (idle) substrates being unheated;

cooling means surrounding said growth position and all of said substrates within said growth chamber to reduce contamination of said idle substrates, said cooling means having an aperture to admit said beams to said growth position.

4,137,866

APPARATUS FOR PREPARATION OF BLOOD SAMPLES

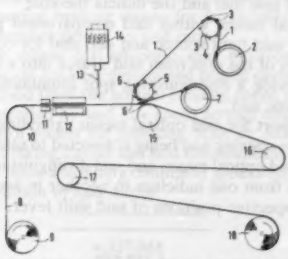
Charles P. Heanley; Jozef K. Tylko, and David G. S. Page, all of 5B Leachlade Rd., Faringdon, Oxon., England (SN7 8AJ)

Filed Apr. 6, 1977, Ser. No. 785,111

Claims priority, application United Kingdom, Apr. 9, 1976, 14494/76

Int. Cl.[2] B05C *11/02*

U.S. Cl. 118—106 **1 Claim**



1. An apparatus for the laying of traces of peripheral blood comprising: a flexible strip and means for depositing a discrete drop of blood upon it; another flexible strip in which a plurality of trace laying members is punched axially at equal intervals and which when flexed over a sprocketed pulley projects the said trace laying members one at a time; means for disposing spatially the two flexible strips so that during the movement of the trace supporting strip there is always a stationary trace laying member protruding downward towards the trace supporting strip so that it will engage the deposited drop of blood when the said drop shall travel thereunder; forming and supporting an index of blood contained between the said travelling trace supporting strip and the facing it plane of the said stationary trace laying member thereby depositing upon the said trace supporting strip a blood trace.

4,137,867

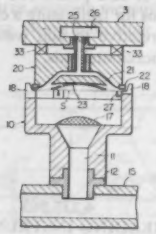
APPARATUS FOR BUMP-PLATING SEMICONDUCTOR WAFERS

Seiichiro Aigo, 3-15-13 Negishi, Daito-ku, Tokyo, Japan

Filed Sep. 12, 1977, Ser. No. 832,332

Int. Cl.[2] B05B *5/02*; B05C *5/00*

U.S. Cl. 118—627 **15 Claims**



1. An apparatus for bump-plating only one surface of semiconductor wafers, said apparatus comprising:

a container;

a plurality of cup-shaped plating basins secured within said container;

each said basin including means for supporting a wafer in a horizontal plane and passage means extending therethrough, one end of said passage means being in communication with the downwardly facing surface of the supported wafer, the other end of said passage means being in communication with a source of plating liquid whereby the plating liquid may be blown upwardly through the passage means and against the downwardly facing surface of the supported wafer;

a cover positioned in opposition and movable vertically with respect to said container;

a plurality of holders secured in said cover with each of said holders being aligned and engagable with a respective one of said plating basins;

each said holder including passage means therethrough, one end of said passage means being in communication with the upwardly facing surface of the supported wafer, the other end of said passage means being in communication with a source of pressurized gas whereby the pressurized gas may be blown downwardly through the passage means and against the upwardly facing surface of the supported wafer; and

cathode and anode means positioned in each said basin, a portion of each said cathode means being in electrical contact with the supported wafer.

4,137,868

METHOD AND APPARATUS FOR GROWING SEAFOOD IN COMMERCIALLY SIGNIFICANT QUANTITIES ON LAND

Taylor A. Pryor, 41-477 Kalanianole Hwy., Waimanalo, Hi.

Filed Sep. 29, 1976, Ser. No. 727,944

Int. Cl.[2] A01K *61/00*

U.S. Cl. 119—2 **12 Claims**

1. A method of growing seafood in commercial quantities comprising the steps of:

providing a source of a plurality of species of phytoplankton;

providing a source of brackish or salt water;

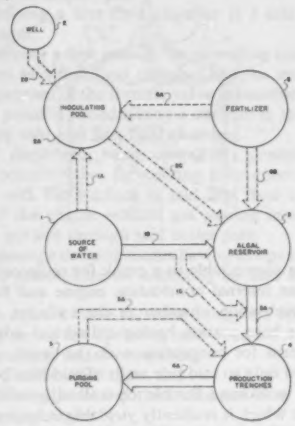
providing an algal reservoir;

transporting water from the source of brackish or salt water to the algal reservoir;

inoculating the water in the algal reservoir with a plurality

of species of phytoplankton from the source of phytoplankton;

adding organic animal manure and inorganic fertilizer to the water in the algal reservoir periodically for providing a mixture which is a nutrient for the plurality of species of phytoplankton used to inoculate the water, and subjecting the mixture to sunlight for increasing the density of each of the plurality of species of phytoplankton in the water;



providing a production trench separate and apart from the algal reservior for containing seafood for which the phytoplankton in the algal reservoir is a nutrient;

placing seafood in the trench; and

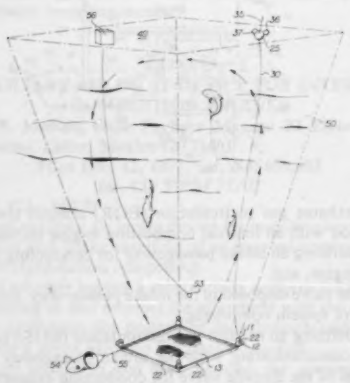
continuously transporting a predetermined percentage of the water and phytoplankton from the algal reservoir through the trench containing the seafood for growing the seafood.

4,137,869

SYSTEM AND METHOD FOR PRODUCTION OF MARINE FOOD USING SUBMERGED PLATFORM

Vernon L. Kipping, 540 Melrose Ave., San Francisco, Calif. 94127

Filed Mar. 28, 1977, Ser. No. 781,697
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—3 **11 Claims**



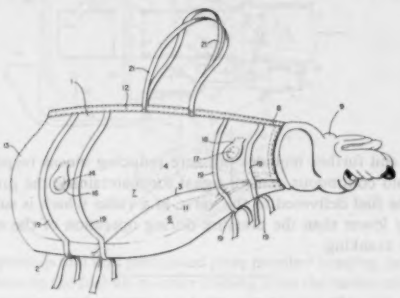
1. A system for production of marine food comprising an open platform containing materials to support flora and fauna, first means located totally below the surface of the water for maintaining said platform submerged at a selected depth in an open body of water within the euphotic zone so that said platform is not subjected to wave action on the surface, and second means for supplying nutrients to said platform over an extended period of time, whereby the occurrence of phytoplankton and plankton in the vicinity of said platform is increased and bloom of zooplankton is increased.

4,137,870

WRAP-AROUND ANIMAL RESTRAINT

Mary A. Cano, 2407 Lomitas La., Santa Rosa, Calif. 95405

Filed Jan. 24, 1977, Ser. No. 761,632
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—96 **4 Claims**



1. A wrap-around animal restraint comprising

a bag including a first side and a second side closed at one end and along one longitudinal edge thereof, the other edges of the sides of the bag being open,

each side having an inner surface and an outer surface,

the first side being free at its open edge to be under the edge of the second side and wrapped around an animal inside said bag tightly thereby to immobilize said animal in said bag,

said second side being free at its open edge to be wrapped over the outer surface of said first side tightly,

and releasable adhesive means adjacent the free edge of the second side of the bag adhesively engaging the outside surface of the wrapped first side spaced from the free edge of the said first side sufficiently to restrain said first side in tightly wrapped position.

4,137,871

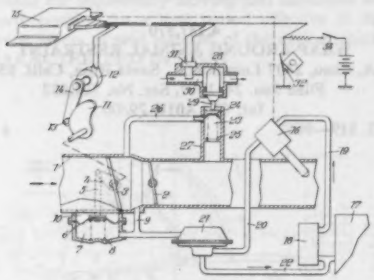
FUEL SUPPLY DEVICE FOR INTERNAL COMBUSTION ENGINE

Bernard G. M. Martel, Bagneux; Philippe G. S. Wallerand, Le Pecq, and Daniel L. Eygret, L'Etang-la-Ville, all of France, assignors to Societe Industrielle de Brevets et d'Etudes S.I.B.E., France

Filed Nov. 10, 1976, Ser. No. 740,651
Claims priority, application France, Nov. 20, 1975, 75 35535
Int. Cl.[2] F02B *3/02*
U.S. Cl. 123—32 EG **9 Claims**

1. A fuel supply device for an internal combustion engine, having auxiliary throttle means located upstream of operator actuated main throttle means in an air intake passage, the auxiliary throttle means being actuated by airflow through the passage so that the position of said auxiliary throttle means is representative of the airflow, a fuel circuit receiving fuel under pressure from a source and opening into said passage through at least one electrically controlled injector valve, and a fuel metering system which is responsive to the position of the auxiliary throttle means and which, during operation, supplies the electrically controlled injector valve with electrical energization pulses whose time width as compared with the period of repetition of the pulses is varied in dependence on the position of the auxiliary throttle means, wherein the metering system

includes starting means responsive to a starting condition of the engine for delivering a continuous energization signal to the injector valve from the time when an engine starter motor is energized until the time when the engine becomes self operative and further includes pressure reducing means responsive to said continuous control signal for maintaining the pressure of the fuel delivered to the valve at a value which is substantially lower than the pressure during operation of the engine after cranking.

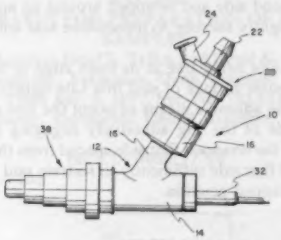


4,137,872

FUEL VAPORIZING DEVICE FOR INTERNAL COMBUSTION ENGINES

Max G. Loflin, Rte. 6, Box 333, Lexington, N.C. 27292

Filed Feb. 25, 1976, Ser. No. 661,149
Int. Cl.[2] F02M *21/06*
U.S. Cl. 123—34 A 7 Claims



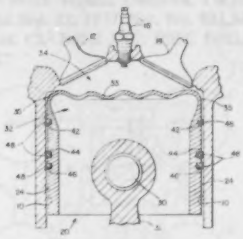
1. A fuel vaporizing device adapted to operate in conjunction with an engine for vaporizing fuel and delivering the vaporized fuel to said engine, said fuel vaporizing device comprising: a normally closed fuel vaporizing chamber for receiving fuel therein; fuel injection means for delivering fuel to said vaporizing chamber; valve means associated with said normally closed fuel vaporizing chamber and operatively connected between said normally closed fuel vaporizing chamber and said engine for selectively controlling the flow of fuel from said vaporizing chamber to said engine, said valve means being normally closed and including control means responsive to the fuel vapor pressure within said normally closed chamber for opening said valve means in response to the presence of a certain fuel vapor pressure level within said vaporizing chamber; and heating means operatively associated with said normally closed fuel vaporizing chamber for heating and vaporizing fuel contained within said chamber to a pressure level where the pressure associated with the vaporized fuel exceeds a certain pressure level sufficient to cause said valve means to open whereupon when said valve means is opened the at least partially vaporized fuel may move from said chamber, through said valve means, and into said engine.

4,137,873

VARIABLE COMPRESSION RATIO PISTON

Dwight A. Caswell, Sr., 15095 Fruitvale Ave., Saratoga, Calif. 95070

Filed Oct. 11, 1977, Ser. No. 841,127
Int. Cl.[2] F02B *75/04*
U.S. Cl. 123—78 B 11 Claims



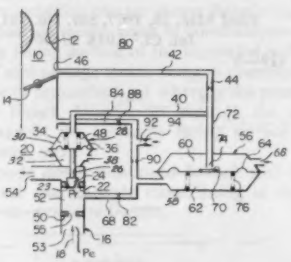
1. A piston connectable to a crank for reciprocation in the cylinder of an internal combustion engine and forming one wall of a combustion chamber in the cylinder, said piston comprising: a base portion having cylindrical side walls and including means for connection with the crank, and a head portion joined only to said side walls of said base portion, said head portion including a flexible top wall adjacent the combustion chamber which is resiliently yieldable in response to pressure within the combustion chamber whereby said head portion flexes downwardly to provide for variation of the compression ratio of the engine.

4,137,874

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Kizuku Otsubo, Kokubunji; Ken Nakamura, Kawasaki, and Syunich Aoyama, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 7, 1976, Ser. No. 748,361
Claims priority, application Japan, Dec. 10, 1975, 50-146278
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A 11 Claims



2. An exhaust gas recirculation (EGR) control system in combination with an internal combustion engine including

means defining an intake passageway for conducting air into the engine, and

a throttle valve disposed in the intake passageway, said EGR control system comprising

means defining an exhaust gas recirculation (EGR) passageway communicating with the intake passageway downstream of the throttle valve for conducting exhaust gas of the engine into the intake passageway, said EGR passageway having upstream and downstream portions and an intermediate portion interposed between said upstream and downstream portions;

means defining an orifice for providing communication between said upstream and intermediate portions;

means defining an outlet port for providing communicating between said intermediate and downstream portions;

said downstream portion and the intake passageway downstream of the throttle valve forming a suction vacuum acting passageway on which an engine suction vacuum acts;

an exhaust gas recirculation (EGR) control valve disposed in said EGR passageway for controlling said outlet port;

a first flexible diaphragm;

means defining a first fluid chamber at a side of said first diaphragm;

means defining a first passage for providing communication between said first fluid chamber and the intake passageway upstream of the throttle valve in its substantially fully closed position for admitting a vacuum in the intake passageway into said first fluid chamber;

said first diaphragm being operatively connected to said EGR control valve for causing it to control, in accordance with the vacuum in said first fluid chamber, the flow of the engine exhaust gas passing into said downstream portion through said outlet port;

said first passage defining means having an open end opening into the atmosphere for admitting air into said first passage;

a vacuum control valve for controlling said open end;

operating means for operating said vacuum control valve, said operating means comprising

a second flexible diaphragm, and

means defining a second fluid chamber at a side of said second diaphragm;

means defining a second passage for providing communication between said second fluid chamber and said intermediate portion for admitting the pressure of fluid therein into said second fluid chamber,

said second diaphragm being operatively connected to said vacuum control valve for causing it to control, in accordance with the pressure to fluid in said second fluid chamber, the amount of atmospheric air admitted into said first passage, and

first control means for causing, in response to a low load operating condition of the engine, said EGR control valve to reduce the flow of the engine exhaust gas passing into said downstream portion through said outlet port, said operating means having

pressure receiving means receiving the pressure in said suction vacuum acting passageway, said first control means comprising

means defining a third passage for providing communication between said suction vacuum acting passageway and said pressure receiving means.

4,137,875

AUXILIARY AIR INLET DEVICE FOR INTERNAL COMBUSTION ENGINES

Sergio P. Medina, Calle Pachuca Manzan 32 Elote 10, San Geronimo, Lidice, Mexico (20 D.F.)

Filed Dec. 12, 1977, Ser. No. 859,482
Int. Cl.[2] F02M *23/02*
U.S. Cl. 123—119 D **8 Claims**

1. In an auxiliary air intake device for installing between the carburetor and intake manifold of an internal combustion engine, the combination comprising:

a base member having a substantially uniform thickness;

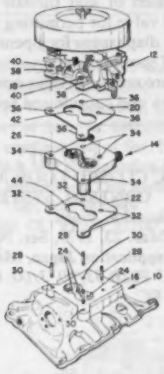
an opening in said member for alignment with the throat of the carburetor for passage of fuel through said opening along a given axis into the intake manifold.

a cavity formed in said base member, the opening of said cavity being adapted for receiving air from the atmosphere;

aperture means within said base member communicating with said cavity and with said opening;

a plurality of tubular members, communicating with said aperture, each of said tubular members terminating in a nozzle opening, said nozzle openings being radially offset from said given axis and;

a perforated plate member substantially closing the exit end of said opening, said perforated plate member and said tubular members being in abutting relation, said nozzle



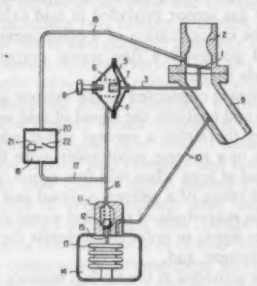
openings and said perforated plate member creating turbulence in the fuel-air mixture coming from the carburetor to combine said mixture with the air passing through said nozzle openings from said cavity through said aperture means whereby to generate a more homogeneous mixture.

4,137,876

OPENING DEVICE FOR THE BUTTERFLY VALVE OF A CARBURETOR

Mario Volpe, Bovray-sur-Juine, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Apr. 12, 1977, Ser. No. 786,869
Claims priority, application France, Apr. 12, 1976, 76 10720
Int. Cl.[2] F02D *11/08*
U.S. Cl. 123—103 R **4 Claims**



1. A throttle-partial opening device for a carburetor of an internal combustion engine for opening the throttle during deceleration, being provided with a pneumatic capsule operating to open the throttle under the action of the vacuum in an induction pipe through the intermediary of a spring-loaded valve set to open at a given level of vacuum, the improvement comprising:

a diaphragm in said capsule and being operatively connected to said carburetor throttle;

an adjustable stop member connected to said pneumatic capsule;

first elastic means in said capsule urging said diaphragm in a direction to close said carburetor throttle over its entire return travel;

second elastic means in said capsule urging said diaphragm

in said direction to close said carburetor throttle over only a part of said return travel, from the position of maximum throttle opening, said second elastic means then being compressed against said adjustable stop member in said capsule under the influence of the vacuum;

conduit means connecting said capsule with said induction pipe downstream of said throttle and having therein a spring-loaded valve for permitting said vacuum therein to act upon said diaphragm for opening said throttle at said given level of vacuum; and

a delayed pressure recovery valve connected to said conduit means between said capsule and said spring-loaded valve.

4,137,877

ELECTRONIC CLOSED LOOP AIR-FUEL RATIO CONTROL SYSTEM

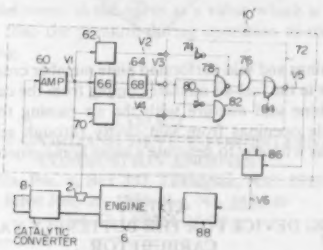
Masaaki Saito, Yokosuka, Japan

Filed Mar. 23, 1977, Ser. No. 780,792

Claims priority, application Japan, Mar. 24, 1976, 51/131447

Int. Cl.[2] F02B *33/00, 3/00;* **F02M** *7/00*

U.S. Cl. 123—119 EC **19 Claims**



1. An electronic closed loop air-fuel ratio control system for supplying an optimum air-fuel mixture to an internal combustion engine, which system comprises in combination:

an air-fuel mixture supply assembly;

an exhaust pipe having exhaust gas flowing therethrough;

an exhaust gas sensor provided in said exhaust pipe which senses the concentration of a component of said exhaust gas, and generates a first signal corresponding to the magnitude thereof;

a control means connected to the exhaust gas sensor which receives and analyzes the signal of said sensor, and which generates therefrom a control signal which has a value which is in a reverse relationship with the value of said first signal at least when said first signal is within a predetermined range of a reference signal and the direction of change in magnitude of said first signal is away from said reference signal, in order to accelerate the response of said control system; and,

an actuator provided in the air-fuel mixture supply assembly and connected to the control means, which receives said control signal and is responsive thereto for adjusting the air-fuel mixture fed to the engine.

4,137,878

SUPPLEMENTARY CARBURETOR

Fred Mineck, Phoenix, Ariz., assignor to Dorothy J. Archer, Phoenix, Ariz.; Jay A. Mineck, Montclair, Calif. and Warren F. B. Lindsley, Phoenix, Ariz., part interest to each

Filed Apr. 19, 1977, Ser. No. 788,795

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 B **7 Claims**

1. A mixing device for gaseous fumes comprising:

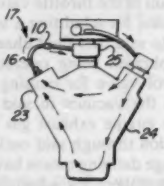
an elongated tubular housing comprising two telescopically interconnected parts and forming a torpedoshaped configuration,

the free end of one of said interconnected parts defining an intake port and the free end of the other of said interconnected parts defining an outlet port,

the interconnected parts defining therebetween within said housing a gaseous fume mixing chamber,

a plurality of openings spacedly positioned around the periphery of one of said parts forming air inlet ports interconnecting atmospheric air with the interior of said chamber,

a deflecting vane mounted within said one of said parts for swirling the gaseous fumes received through said intake port in said first part of said housing and discharging said



swirling gases into said chamber, wherein the swirling gaseous fumes are aerated by air injected into said swirling gaseous fumes prior to discharge out of said outlet port,

said mixing chamber having a bore diameter greater than the bore of the intake and outlet ports of said parts,

the periphery of said mixing chamber tapering into the bore of said outlet port which together with said air inlet ports forms a venturi for further aerating said swirling gaseous fumes, and

the free ends of each of said parts being tapered to form nozzles for receiving in slip-tight fitting arrangement fume-conducting bore sections.

4,137,879

EXHAUST GAS RECIRCULATION MEANS

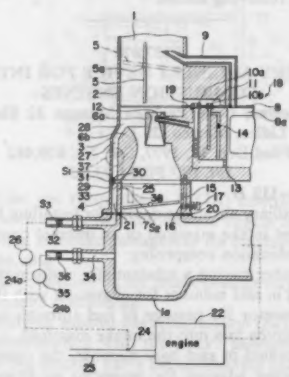
Gengo Kageyama, and Junji Kamite, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jun. 15, 1977, Ser. No. 806,883

Claims priority, application Japan, Jun. 17, 1976, 51-71852; Jul. 14, 1976, 51-84399; Jul. 14, 1976, 51-84400; Jun. 22, 1976, 51-83422[U]; Jul. 14, 1976, 51-94398[U]; Jul. 16, 1976, 51-95236[U]; Jul. 16, 1976, 51-95237[U]

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **12 Claims**



1. In an internal combustion engine having a carburetor including, a choke section constituting an air intake portion of said carburetor, a venturi section connected downstream of the choke section and provided with a venturi, a fuel introduction

system connected to said venturi section for introduction of fuel into air passing through said venturi section, and a throttle section connected downstream of the venturi section and provided with a throttle valve, a slow port and idle port and communicating with an inlet manifold leading to a combustion chamber of said engine, the slow port and the idle port being positioned respectively upstream and downstream of the throttle valve when the throttle valve is in the fully closed position, and

exhaust pipe means for removal of exhaust gas from said engine;

exhaust gas recirculation means comprising:

port means which opens to an interior portion of said carburetor which is intermediate said venturi and said throttle valve;

an exhaust recirculation line which has an inlet end portion connected to said exhaust pipe means, and a delivery end portion communicating with said port means for delivering exhaust gas through said port means into said carburetor, and flow control means in said exhaust recirculation line adjustable to control the flow of exhaust gas; and

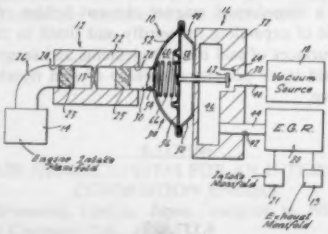
a supplementary air duct in said carburetor, and which has an inlet end opening upstream of said venturi, and a delivery end portion communicating with said port means for delivering air through said port means into said carburetor.

4,137,880

TIME DELAY APPARATUS FOR AN EXHAUST GAS RECIRCULATION CONTROLLER

Jorma O. Sarto, Orchard Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 3, 1977, Ser. No. 848,069
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **10 Claims**



1. In a motor vehicle with an internal combustion engine having a controller valve for controlling the recirculation of exhaust gases from the exhaust manifold of the engine to the intake manifold thereof, the valve being of the type operated by a vacuum signal transmitted from a source within the engine through a flow conduit to the controller, a vacuum delay valve installed in the flow conduit intermediate the controller and the vacuum source for delaying the transmittal of the vacuum signal to the controller during the starting of the engine, the vacuum delay valve comprising:

A. vacuum relay valve means having;

1. housing means defining an outlet port fluidly connected to said vacuum source and an inlet port fluidly connected to the controller;

2. valve means disposed fluidly intermediate said inlet and outlet ports and moveable between a closed position preventing flow therebetween and an open position permitting flow;

3. a signal conduit having a downstream end in fluid communication with said engine intake manifold and an upstream end;

4. pressure responsive actuator means in fluid communication with said signal conduit upstream end for moving said valve means from said closed position to said open position in response to an increase in engine intake manifold vacuum above a predetermined level; and

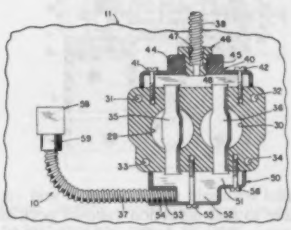
B. vacuum signal delay means comprising orifice means disposed in said signal conduit intermediate said engine intake manifold and said actuator means whereby movement of said valve means between said closed and open position is delayed a predetermined length of time.

4,137,881

APPARATUS USING EXHAUST GAS FOR FUEL VAPORIZATION

Wilmer C. Jordan, 3915 W. Wrightwood, Chicago, Ill. 60647

Continuation-in-part of Ser. No. 680,295, Apr. 26, 1976, abandoned, which is a continuation of Ser. No. 480,849, Jul. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 378,836, Jul. 13, 1973, abandoned. This application Nov. 2, 1977, Ser. No. 847,949
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 AA **23 Claims**



1. For use with a carburetor of an internal combustion engine having at least two generally circular barrels, an apparatus for vaporizing fuel in an air-fuel mixture, said apparatus comprising, a plate adapted to be mounted between a carburetor and openings in the intake manifold of the engine, said plate having at least two passages which mate with and align with the barrels of the carburetor and the manifold openings, heating means for heating fuel flowing through said passages, insulating means between said plate and the carburetor, said heating means including two tubular elements, each element extending across one of said passages generally along a diameter of the said passage and transverse to the axis of rotation of a butterfly throttle valve of the carburetor, each said element having a predetermined width transverse to the flow of fuel and air, inlet flow control means coupled to respective first ends of said elements, outlet flow control means coupled to respective second ends of said elements and venting to atmosphere, said inlet flow control means having a first gas flow constricting orifice of predetermined area, said outlet flow control means having a second gas flow constricting orifice of predetermined area less than the area of said first constricting orifice, and the construction, arrangement and dimensions of said elements, said first orifice and said second orifice providing for efficient and effective vaporization of the fuel with minimal heating of the air.

4,137,882

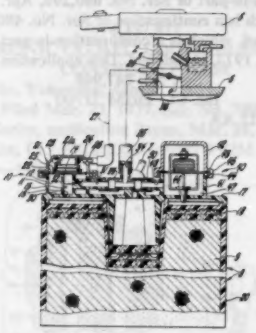
EMISSION CONTROL SYSTEM WITH ALTITUDE COMPENSATED PURGE VALVE

William F. Thornburgh, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 22, 1977, Ser. No. 826,374
Int. Cl.[2] F02M *59/00*
U.S. Cl. 123—136 **2 Claims**

1. In a fuel vapor purge system for a vehicle having a fuel vapor storage canister receiving fuel vapor from a fuel reservoir means used to supply fuel to an internal combustion engine, the engine having an induction passage with flow therethrough controlled by a throttle valve, the induction passage

having a ported vacuum port therein traversed by the throttle valve and an induction vacuum port located below the throttle valve, the fuel vapor purge system including a vacuum actuated purge valve having at least one purge inlet in communication with said canister for receiving fuel vapor therefrom, a purge outlet with an orifice restriction therein in communication with said induction vacuum port and with a diaphragm actuated valve means therein controlling flow from said purge inlet to said purge outlet with one side of said diaphragm actuated valve means being connected to said ported vacuum port, the improvement wherein said fuel vapor purge system further includes an altitude compensated purge valve con-



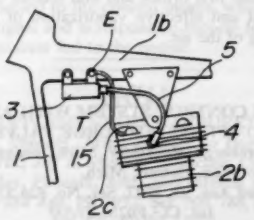
nected in parallel with said purge outlet of said vacuum actuated purge valve to said induction vacuum port, said altitude compensated purge valve including a housing having an inlet connected to said canister to receive fuel vapors therefrom and an outlet connected to said induction vacuum port and, an aneroid actuated valve means in said housing operatively positioned to control fuel vapor flow from said canister through said inlet into said housing as a function of atmospheric pressure such that at high atmospheric pressure, corresponding to operation of the engine at low altitude, the flow through said inlet is substantially restricted and at low atmospheric pressure, corresponding to operation of the engine at high altitude, the flow through said inlet increases.

4,137,883

DEVICE FOR SUPPRESSING DISTURBANCE ELECTRIC WAVE FOR MOTORCYCLES

Mitsutaka Yoshida, Chita, and Toshikazu Kawakami, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and NGK Spark Plug Co., Ltd., Nagoya, both of, Japan

Filed Sep. 21, 1977, Ser. No. 835,134
Claims priority, application Japan, Oct. 6, 1976, 51-119270
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 P **9 Claims**



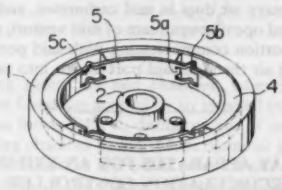
1. A device for suppressing a disturbance electric wave for motorcycles, comprising a frame, an engine mounted on said frame and including a combustion chamber, an ignition plug secured to a top portion of said combustion chamber, an ignition coil secured to that portion of said frame which is located near said ignition plug and having primary and secondary coils, and a flexible wire for connecting a ground terminal of said secondary coil or a ground terminal located at that portion of said frame which is substantially the same in potential as said ground terminal of said secondary coil to said top portion of said combustion chamber of said engine.

4,137,884

MAGNETO FOR MOTOR VEHICLE

Mituo Odazima; Rokuro Kikuchi, and Arata Ataka, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 15, 1976, Ser. No. 705,528
Claims priority, application Japan, Jul. 25, 1975, 50-90091
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—149 D **15 Claims**



1. In a magneto for a motor vehicle including a flywheel adapted to be driven in timed relation to the engine and a set of magnet elements secured as an excitation source to the inner peripheral surface of the rim of said flywheel, the improvement comprising a ring-shaped magnet element holder of spring steel capable of expanding outwardly and fitted to the inner peripheral surfaces of said magnet elements and secured altogether to said inner peripheral surface of said flywheel rim with adhesive.

4,137,885

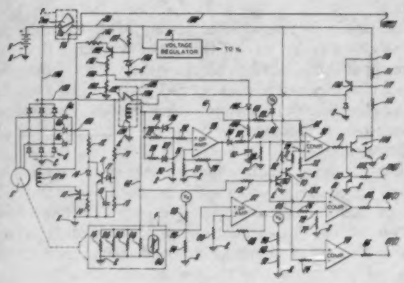
DIESEL ENGINE GLOW PLUG ENERGIZATION CONTROL CIRCUIT

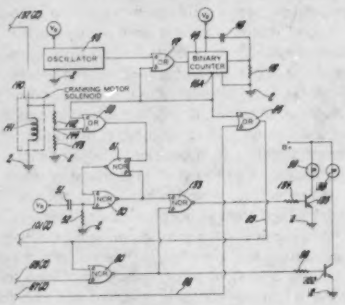
David L. Van Ostrom, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 11, 1977, Ser. No. 841,126
Int. Cl.[2] F02N *17/00*
U.S. Cl. 123—179 H **10 Claims**

1. A Diesel engine glow plug energization control circuit for use with Diesel engines having at least one glow plug comprising in combination with a circuit operating potential source; glow plug temperature simulator means energized by said operating potential source for producing an electrical signal having a rate of increase of potential level substantially corresponding to the rate of increase of glow plug temperature and a rate of decrease of potential level substantially corresponding to the rate of decrease of glow plug temperature upon glow plug energization and subsequent deenergization, respectively, whereby the instantaneous potential level of said electrical signal is indicative of glow plug temperature at that instant; and means effective to complete a glow plug energizing circuit across said operating potential source in response to the application of operating potential and, thereafter, being effective to alternately interrupt and complete said glow plug energizing circuit in response to the increase of said electrical signal to a

predetermined potential level and in response to the decrease of said electrical signal to another lower predetermined potential level, respectively, whereby said glow plug energizing circuit is cyclically completed and interrupted.





4,137,886

AIR INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Iwao Hiramatsu, Omiya, Japan, assignor to Nissan Diesel Motor Company, Ltd., Japan

Continuation of Ser. No. 661,010, Feb. 24, 1976, abandoned. This application Oct. 14, 1977, Ser. No. 842,331

Claims priority, application Japan, Mar. 11, 1975, 50-028617; Mar. 11, 1975, 50-028618

Int. Cl.[2] F01L *3/00, 1/32*

U.S. Cl. 123—188 AF **7 Claims**

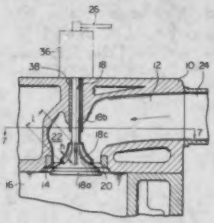
1. An air intake system for an internal combustion engine including at least a cylinder head therein, a combustion chamber, comprising:

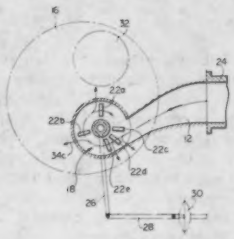
a cylinder head mounted on said cylinder and having therein a spiral-shaped intake port capable of communicating with said combustion chamber for introducing an intake air into said combustion chamber, said spiral-shaped intake port producing a swirling flow of said intake air while said intake air passes along said intake port;

an intake valve rotatably mounted in said cylinder head for opening and closing between said intake port and said combustion chamber;

at least a baffle provided on a portion of said intake valve which is exposed to said intake port, said baffle being arranged so as to resist said swirling intake air flow when said incoming intake air reaches and impinges upon said intake valve thereby attenuating the motion of said swirling intake air flow; and

means for rotating said intake valve about the axis thereof in response to change in the speed of said internal combustion engine thereby controlling relative position of said baffle to said swirling intake air flow.





4,137,887

PISTONS FOR INTERNAL COMBUSTION ENGINES

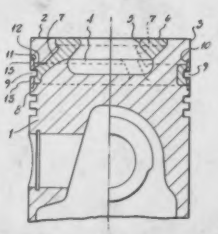
Stephen J. Dunn, Peterborough, England, assignor to Perkins Engines Limited, London, England

Filed Jun. 6, 1977, Ser. No. 804,118

Claims priority, application United Kingdom, Jun. 11, 1976, 24213/76; Aug. 19, 1976, 34565/76

Int. Cl.[2] F02F *3/08*

U.S. Cl. 123—193 P **7 Claims**



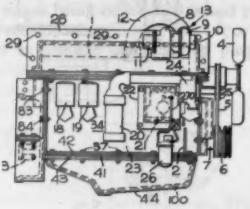
1. A piston comprising a piston body of a first metal, a crown in an upper part of said body, a cylindrical wall depending from said crown, a combustion chamber in said crown, an insert of a second metal embedded in said crown and defining a lip overhanging said chamber, said insert including an outer annular portion located in said wall and defining piston ring carrier means, and a circumferentially extending band of a sprayed bonding material selected from the group consisting of a third metal and a cermet, said band being bonded to the outside of said outer annular potion of said insert and to an adjacent portion of said body.

4,137,888

SOUND ABATEMENT DEVICE FOR INTERNAL COMBUSTION ENGINE

Kenneth N. Allan, Menomonee Falls, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 24, 1976, Ser. No. 744,887
Int. Cl.[2] F02B 77/00
U.S. Cl. 123—198 E **14 Claims**



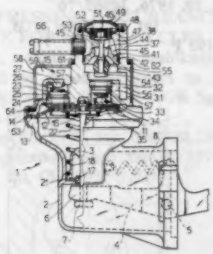
1. A sound abatement device on an internal combustion engine comprising, an internal combustion engine, a contoured integral sound attenuating shell contoured to the external surface of the engine, resilient means mounting said shell in closely spaced relation to said engine, a plurality of sections forming said shell to facilitate assembly and mounting on said engine, fastening means sealing and fastening said sections together to form said shell, means defining openings in said shell, low emission accessories mounted on said engine and extending through said openings in said shell for operating externally of said shell, high maintenance components mounted on said engine and extending through said openings in said shell for maintenance of said components and said engine from externally of said shell to thereby provide a sound abatement device on said internal combustion engine.

4,137,889

FUEL DIAPHRAGM PUMP WITH SHUT-OFF VALVE

Antonio Nigra, Nole Canavese (Turin), Italy, assignor to Gilardini S.p.A., Turin, Italy

Filed Jul. 21, 1977, Ser. No. 817,774
Claims priority, application Italy, Mar. 7, 1977, 67492 A/77
Int. Cl.[2] F02B 77/08
U.S. Cl. 123—198 DB **6 Claims**



1. A fuel pump for feeding fuel to an endothermic engine, comprising:

housing means;

a first displaceable sealing member secured to the housing means and defining therewith a pumping chamber, the housing means defining an inlet passage for passing fuel from a tank into said pumping chamber and an outlet for passing fuel from said pumping chamber to the engine;

drive means operatively connected to displace the first sealing member thereby alternately to increase and decrease the volume of the pumping chamber;

a suction valve disposed to admit fuel to the pumping chamber from the inlet passage when the first sealing member is displaced to increase the volume of the pumping chamber and to prevent fuel from leaving the pumping chamber by way of the inlet passage when the first sealing member is displaced to decrease the volume of the pumping chamber;

a discharge valve disposed to permit fuel to leave the pumping chamber by way of the outlet when the first sealing member is displaced to decrease the volume of the pumping chamber and to prevent fuel from entering the pumping chamber from the outlet when the first sealing member is displaced to increase the volume of the pumping chamber; and

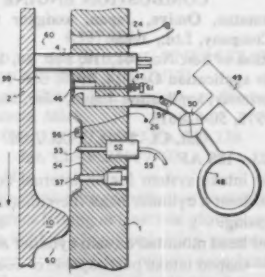
a shut-off valve which is independent of the suction valve and the discharge valve and is disposed within the housing at a position upstream, with respect to the direction of flow of fuel through the pump, of the suction valve, the shut-off valve comprising a second sealing member which is subject at one side to atmospheric pressure and at its other side to the pressure of fuel upstream of the suction valve and is displaceable between an outer position and an inner position, and a valve member which is connected to the second sealing member and is disposed in a normal position, in which it permits fuel to flow along the inlet passage to the pumping chamber, when the second sealing member is in said inner position, and is disposed in a shut-off position, in which it substantially prevents such flow, when the second sealing member is in said outer position, the second sealing member remaining in its inner position owing to the weight of the valve member when the pressure of fuel acting on said other side of the second sealing member is less than atmospheric and the force acting on the valve member owing to the pressure difference across the second sealing member is directed downwardly, and the second sealing member being displaced to its outer position when the pump is inverted and the pressure of fuel acting on said other side of the second sealing member exceeds a predetermined limit.

4,137,890

TOROID SWEEP ENGINE

Stephen M. Wohl, P.O. Box 117, Lachine, Quebec, Canada (H8S 4A5)

Filed Dec. 21, 1973, Ser. No. 427,324
Int. Cl.[2] F02B 53/04
U.S. Cl. 123—205 **12 Claims**



1. A process for converting latent heat of combustion of fuel into mechanical power, whereby fuel is burned between two obstacles inside a toroidal-shaped chamber, the walls of the chamber being partitioned into at least two ring-like sections which individually encompass the straight-line toroid axis and which rotate relative to one another in a single direction around the toroid axis, two of the ring-like wall sections each supporting a different one of the said obstacles, one of the said two ring-like wall sections transmitting, during combustion of the fuel, power from the said obstacle which that wall section supports, the obstacles being enabled to pass each other during obstacle rendezvous by virtue of the temporary retraction of

one of the said obstacles from the toroidal chamber through a cavity in the wall section supporting said obstacle, a pull on said retractable obstacle from outside of the toroidal chamber drawing said retractable obstacle from the toroidal chamber at the beginning of obstacle rendezvous, all geometric circles which are both (1) contained in the interior of the toroidal chamber, and (2) centered on the toroid axis, being interrupted by each of the two said obstacles substantially during all periods except during obstacle rendezvous, the said process including the following sequence of events:

(a) hot air, at a temperature above the self-ignition temperature of the fuel, is induced into the enlarging portion of toroidal chamber space lying between the two obstacles after obstacle rendezvous;

(b) air induction is closed off;

(c) substantially after the close of air induction, a measure of fuel is injected into the air charge that is already within the toroidal chamber, and burns, the products of combustion generating pressure in the injected space and forcing the obstacles to separate from one another, the period of injection of fuel being longer than the period of induction of hot air;

(d) fuel injection is closed off;

(e) the obstacles rendezvous: a pull from outside of the toroidal chamber impels one of the said obstacles to retract from the toroidal chamber through a cavity in the wall section which supports said retractable obstacle, said retraction being of sufficient displacement and duration to allow the other of the said obstacles to pass by;

(f) at the end of obstacle rendezvous the retractable obstacle is impelled to return to the toroidal chamber, resuming interruption of all said geometric circles;

(g) events (a), (b), (c), and (d) repeat;

(h) the obstacles, as they approach one another, sweep and squeeze spent gases out of the diminishing portion of toroidal chamber space lying between the two obstacles;

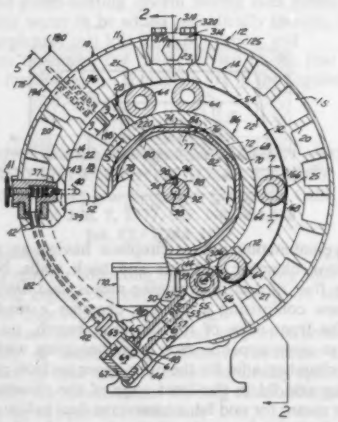
(i) events (e), (f), (a), (b), (c), (d), and (h) repeat themselves cyclically.

4,137,891

ORBITING PISTON ROTARY ENGINE

William P. Dalrymple, 415 W. University, Rochester, Mich. 48063

Filed Jul. 22, 1977, Ser. No. 818,241
Int. Cl.² F02B *53/00*
U.S. Cl. 123—245 **16 Claims**



1. An orbiting-piston rotary internal combustion engine, comprising

a housing structure having a stator with a generally cylindrical internal surface therein and having end closure members secured to opposite sides of said stator,

a power shaft journaled in said closure members coaxial with said internal stator surface for rotation in a forward direction,

a generally-cylindrical rotor rotatably mounted on said shaft and having a generally cylindrical external surface disposed coaxial with said stator internal surface and defining with said stator internal surface and said end closure members and annular working chamber,

a multiplicity of cylindrical roller pistons disposed in said working chamber with their opposite ends in sliding sealing engagement with said end closure members and with their axes parallel to the axis of said cylindrical stator and rotor and movable orbitally in said forward direction around said working chamber with their peripheries in snugly rolling engagement with said internal and external surfaces of said stator and rotor respectively and in driving engagement with said rotor external surface,

first and second piston retarders disposed in circumferentially-spaced relationship in said housing structure and movable between piston-passing positions and piston-retarding positions in said working chamber and dividing said working chamber into a compression chamber and a combustion chamber,

said housing structure having an inlet port communicating with said compression chamber and an outlet port communicating with said combustion chamber,

means for introducing a combustible fuel into said combustion chamber,

means communicating with said combustion chamber for igniting said combustible fuel therein operable in timed relationship with the passage of a roller piston by said first piston retarder into said combustion chamber,

means responsive to the pressure of the burning gases in said combustion chamber for moving said passing piston backward into temporarily-halted position against said first piston-retarder,

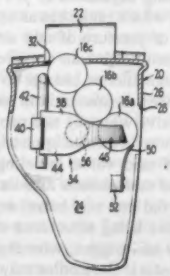
and means responsive to the pressure of the fuel gases while under compression in said compression chamber for moving said second piston retarder into temporary piston-retarding position in said combustion chamber and responsive to the decline of said pressure of the fuel gases in said compression chamber for releasing said second piston retarder from piston-retarding position in said combustion chamber to piston-passing position relatively thereto.

4,137,892

HOLSTER-SHAPED DEVICE FOR FIRING PROJECTILES

Eugene Jaworski, Park Ridge, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 17, 1977, Ser. No. 825,194
Int. Cl.² F41B *7/00*
U.S. Cl. 124—10 **14 Claims**



1. An amusement device for attachment to the belt or the waistband of a game player, comprising:

a generally holster-shaped enclosure for holding a plurality of projectiles and having an inside wall and an outer sidewall with at least a portion of one of said walls being movable toward and away from the other of said walls when struck by the hand of said game player, said enclosure including a discharge opening for projectiles between said inside and outside walls; and

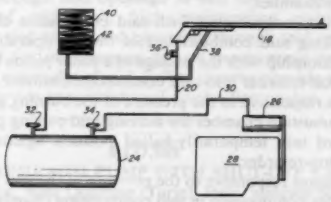
means disposed within and carried by said holster-shaped enclosure for retaining and firing projectiles one at a time out of said discharge opening when one of said walls is depressed toward the other of said walls.

4,137,893

RIOT CONTROL WEAPON

Aaron C. Beauchamp, Moline, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 31, 1977, Ser. No. 847,362
Int. Cl.[2] F41F *1/04*
U.S. Cl. 124—72 **3 Claims**



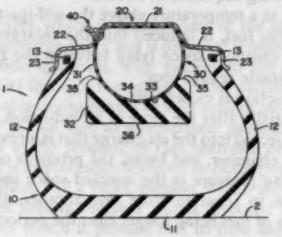
1. A riot control weapon comprising an air pressure source, an air powered rifle connected thereto, and a supply of projectiles continuously feedable to said rifle for ejection therefrom, said rifle including a barrel through which said projectiles are to be ejected, said air pressure source comprising an air compressor connected to an air tank for compressing air therein to a given pressure level, said rifle having a trigger actuated valve, said valve being in an air line, said air line extending between said tank and said barrel, movement of said trigger to a depressed position actuating said valve, which initiates a continuous flow of compressed air through the weapon for ejection of said projectiles, regulator means between said air tank and said valve for controlling ejection pressure and hence range of fire of said rifle, said regulator means being located in said air line and being adjustable to provide a range of pressures to said barrel, which range has an upper limit determined by the given level of pressure of said air tank, said regulator means, when adjusted while said compressed air flows therepast, providing instantaneous change to the pressure in said barrel, said rifle having an ammunition tube connected thereto forwardly of said valve whereby said projectiles may pass into said barrel for ejection therefrom upon trigger actuation of said valve, actuation of said valve initiating said flow of compressed air past said ammunition tube causing said projectiles to be continuously fed into said barrel and sucessively ejected therefrom, said valve being structured so as to be capable of being held open by said trigger, whereby upon a single actuation of said valve, plural projectiles may be ejected from said barrel in quick succession, said ammunition tube terminating in an ammunition storage container whereby said projectiles may be stored in said container and fed into said tube for transmittal to said rifle barrel.

4,137,894

PNEUMATIC TIRE, RIM AND RUN-FLAT SYSTEM COMBINATION

James D. Gardner, Akron, and James P. Lawrence, Wadsworth, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 17, 1977, Ser. No. 807,609
Int. Cl.[2] B60C *17/00*
U.S. Cl. 152—330 RF **8 Claims**



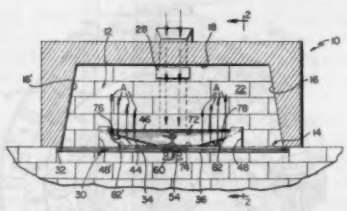
1. In combination, a pneumatic tire, a rim and a run-flat support system, said pneumatic tire comprising an annular tread portion and sidewalls connecting the lateral edges of said tread to bead areas which contain annular bead bundles, said rim comprising an annular drop center area having laterally extending bead seats on either side thereof which terminate in rim flanges, said run-flat support system comprising a pneumatic tube member and a separate, free-floating ring member, said tube member located in the drop center area of said rim and said ring member located radially outwardly of said tube in contact with said tube, said tube member having a fabric reinforcement with the cords of said fabric disposed substantially parallel to the axis of rotation of said combination, said ring member supported solely by said tube during both the normal and run-flat operation of said combination so that said ring member does not contact said rim or said tire sidewalls or bead areas when the tire is either under normal load or run-flat.

4,137,895

DRAFT DEVICE FOR FIREPLACE

Raymond W. Bittinger, 506 Franklin St., Carlisle, Pa. 17013

Filed Aug. 23, 1977, Ser. No. 827,010
Int. Cl.[2] F24B *1/18*
U.S. Cl. 126—120 **4 Claims**



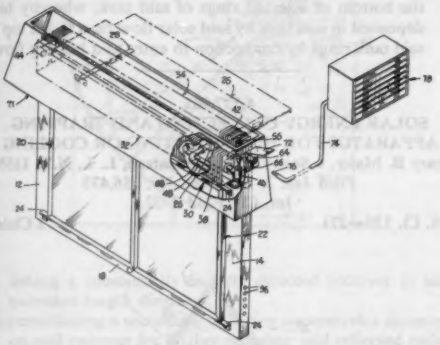
1. In combination with a fireplace having an open front combustion chamber and side and back walls, hearth, and chimney flue, of draft introducing means, said draft introducing means comprising a plenum chamber extending solely along the front edge of the fireplace hearth, said chamber having an open upper surface communicating with the combustion chamber, a lid for the open upper surface, pivot means mounting said lid to the front edge of the plenum chamber, actuator means for said lid, a transverse duct below said hearth communicating at one end with the plenum chamber and at the other end with ambient atmosphere remote from the plenum chamber, a baffle plate in said plenum chamber, said baffle plate being shaped such that airflow from the open upper surface of the plenum chamber is at a maximum at the ends of

the chamber and gradually decreases to zero flow at the center of the plenum.

4,137,896
FIREPLACE ENCLOSURE AND HEAT-EXCHANGER UNIT

Harrison F. Edwards, Norwich, N.Y., assignor to Sunbeam Corporation, Chicago, Ill.

Filed Jun. 23, 1977, Ser. No. 809,186
Int. Cl.[2] F24B *7/02;* F24C *15/10*
U.S. Cl. 126—140 24 Claims



1. A combination fireplace enclosure and heat-exchanger unit for providing supplemental heat to areas external to a fireplace, comprising in combination:

(a) a fireplace enclosure frame and closure doors carried thereby and movable between open and closed positions,

(b) a steam-heating system attached to said enclosure frame, said system being vented to the atmosphere and including:

(1) a boiler device adapted to convert water into steam,

(2) a heat-exchanger device carried on said frame and having a steam passage,

(3) means providing a steam line between the boiler device and the steam passage of said exchanger device, to conduct steam to the latter for condensation therein,

(4) substantial portions of said steam passage being disposed above the level of the boiler device,

(5) said steam-heating system providing for gravity drainage of condensate back to the boiler device for subsequent heating and conversion to steam,

(6) said steam-heating system having inlet means for enabling water to be added periodically thereto, in order to replenish that lost by vaporization, and

(c) means mounting the boiler device to the rear of said frame for disposition above the fire in the fireplace.

4,137,897
UNIFIED ARRAY FOR COLLECTION AND CONCENTRATION OF SOLAR ENERGY

Walter T. Moore, 782 Mardigras Ct., Camarillo, Calif. 93010

Filed Jun. 7, 1977, Ser. No. 804,448
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 23 Claims

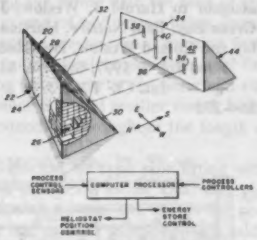
1. In a system for collecting and concentrating solar energy for providing highly concentrated solar energy to an energy receiver, the improvement comprising:

support means including a terraced support structure;

a plurality of substantially reflective collector elements mounted on said support means in closely spaced apart generally non-interelement shading relationship as a unified array of operative elements;

said collector elements having surfaces formed as confocal parabolas for effective direction off axis with respect to the energy receiver during most of the period for which sunlight is available;

said plurality of collector elements being positioned for reflecting solar energy collected generally horizontally to the energy receiver; and

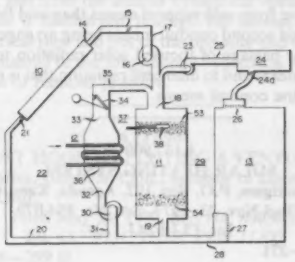


means for driving said collector elements in tracking relationship with said sun while continuously reflecting solar energy toward said energy receiver.

4,137,898
AIR TYPE SOLAR HEATING SYSTEM

Hisao Koizumi, Zushi; Yoshinosuke Kawada, Yokohama; Hiroaki Murasaki, Zushi, and Satoshi Hisaoka, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 23, 1976, Ser. No. 753,823
Claims priority, application Japan, Dec. 26, 1975, 51-154771; Dec. 26, 1975, 51-154772; Dec. 26, 1975, 51-158664
Int. Cl.[2] F24J *3/02;* F24D *5/00*
U.S. Cl. 126—270 12 Claims

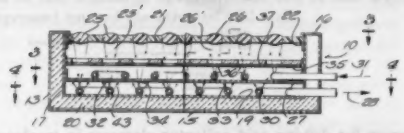


1. An air type heating system comprising a heat-charging circuit including a heat storage apparatus provided with first and second air openings between which air flows, a heat collector connected between the air openings of the heat storage appartus to heat air streams running through said collector by solar energy, a first blower connected between said heat collector and said first air opening for circulating air streams through the heat storage apparatus in a first direction from the first air opening to the second air opening of the heat storage appartus, and an air flow rate-controlling device connected between said heat collector and said first air opening for regulating an amount of air thus circulated, said heat storage apparatus containing heat-storage material for absorbing heat from the air heated by the heat collector and progressively accumulating heat, starting with the first air opening; and a heat discharging circuit including a heated chamber connected to the first and second air openings of the heat storage apparatus, and a second blower connected to the first air opening for circulating air through the heat storage apparatus in a direction opposite the first direction from the second air opening to the first air opening of the heat storage apparatus, heating air by the heat accumulated in the heat storage material, and conducting the heated air through said first air opening to the chamber of a dwelling being heated.

4,137,899

MULTISTAGE SOLAR ENERGY CONCENTRATOR

Harold J. Weslow, Rte. 4, Riverside Dr., Green Bay, Wis. 54303, assignor to Harold J. Weslow; Jerome H. Weslow, both of Green Bay; Paul Netzow, Hartland; Thomas Weslow, Green Bay and Roland Weslow, Hartland, all of, Wis.

Filed Jul. 5, 1977, Ser. No. 812,944
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **17 Claims**

1. Apparatus for utilizing solar radiation to heat fluid comprising:

a housing,

support means and a plurality of lenses arranged on said support means for focusing solar radiation into said housing,

a first plurality of interconnected and spaced apart conduit means for conducting fluid which is to be heated, said first conduit means being disposed in said housing substantially at the focus of said lenses remotely from said support means, and

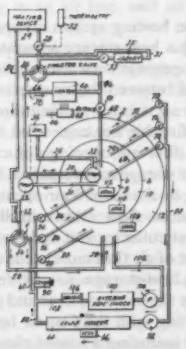
a second plurality of interconnected and spaced apart conduit means in said housing for conducting fluid which is to be heated, said second conduit means being interposed between said first conduit means and said lenses and being less remote from said support means than said first conduit means, said second conduit means being arranged to allow spaces for passage of focused solar radiation to said first conduit means and to intercept radiation that is re-radiated by said first conduit means.

4,137,900

SOLAR HEATING SYSTEM

Robert F. Brautigam, P.O. Box 102, Agenda, Kans. 66930

Filed Nov. 23, 1977, Ser. No. 854,079
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **10 Claims**



1. A solar heating system comprising:

a. a large tank divided by suitable partitions into a series of vertically concentric rings, and substantially filled with liquid,

b. means adjacent the tops of said partitions and operable to permit the flow of liquid from ring to ring inwardly from the outermost ring to the center ring, but not outwardly,

c. a liquid-operated heating device operable to disperse heat from a heated liquid passed therethrough into a comfort zone,

d. a heating flow circulating means operable to draw liquid from the top of the center ring, pass it through said heating device, and return it to the top of the outermost ring, thereby establishing a gravity-induced flow of liquid inwardly across the tops of said tank rings,

e. a solar heat collection device adapted to be exposed to solar radiation to heat liquid circulated therethrough, and

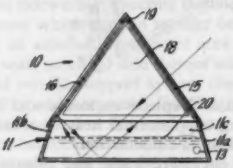
f. a solar flow circulating means operable to draw liquid from the bottom of selected rings of said tank, circulate it through said solar heat collection device, and return it to the bottom of selected rings of said tank, whereby heat deposited in said tank by said solar flow rises to the top of said tank rings by convection to enter said heating flow.

4,137,901

SOLAR ENERGY COLLECTING AND TRAPPING APPARATUS FOR HOME HEATING OR COOLING

Henry B. Maier, 6 Sealey Ave., Hempstead, L. I., N.Y. 11550

Filed Jan. 3, 1977, Ser. No. 756,473
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **2 Claims**



1. A solar energy collecting and trapping apparatus comprising a pan member having upstanding side wall means and a non-reflecting bottom portion for accommodating therein a body of fluid material inputted thereto and removed therefrom at a predetermined rate, a front panel means made from a transparent material for permitting the sun rays to enter said body of fluid, and a reflector panel means shaped and positioned with respect to said front panel means for returning any dispersed radiation energy back into said fluid body, wherein said pan member is formed as a singly molded unit, said reflector panel means being snugly fitable over said pan member when in operative position, said frontal panel means is being formed as a singly molded unit snugly fitable when in operative position over said pan member, wherein said side wall means are parabolic surfaces and wherein said reflector means is a parabolic surface in shape.

4,137,902

ENERGY CONCENTRATOR SYSTEM

Jesse C. Bunch, 816 Easley St., Silver Spring, Md. 20910

Filed Jun. 13, 1977, Ser. No. 805,867
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **30 Claims**

1. A radiant energy concentrator system, comprising:

(a) reflector means fixedly secured to a base surface, said reflector means for reflecting incident radiation impinging thereon from an energy source;

(b) receiver means having an extended length in a predetermined direction, said extended length being maintained in a direction substantially parallel with said incident radiation, said receiver means including collector tube means having an axis positionally locatable in a direction substantially parallel said incident radiation direction independent of said fixed reflector means;

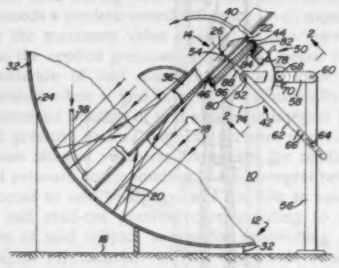
(c) secondary radiation concentration means mounted on said receiver means for further concentrating said reflected radiation to said receiver means; and,

(d) receiver displacement means secured to said receiver means for displacing and maintaining said extended length of said receiver means in said parallel direction responsive to directional variations of said incident radiation.

24. A method for concentrating reflected radiant energy to a predetermined area, including the steps of:

(a) establishing a stationary spherical reflector having a principal axis;

(b) providing a movable receiver having an extended length in a predetermined direction including the step of establishing a substantially linearly directed receiver in said extended length direction;



(c) establishing a secondary radiation concentrator mounted on said receiver for further radiating said reflected radiation to said receiver;

(d) independently displacing said receiver into parallel relation along said extended length with an incident radiant energy direction impinging on said stationary spherical reflector; and,

(e) reflecting said incident radiant energy from said reflector to said receiver.

4,137,903

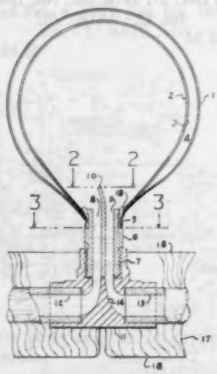
SOLAR HEAT ABSORBER

Charles E. Annett, II, 213 Chardin Dr., Nokomis, Fla. 33555

Filed Aug. 19, 1977, Ser. No. 826,259

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **3 Claims**



1. A solar heat absorber comprising:

an essentially spherical transparent vessel provided with an open neck on its surface,

a smaller essentially spherical vessel having a solar heat absorbing coating thereon located within the aforesaid transparent vessel, means to provide a smaller open neck on said smaller spherical vessel, the neck of the smaller spherical vessel being hermetically sealed to the neck of the surrounding vessel and the means forming a vacuum in the space between said vessels,

a tubular solar heat absorber fitting, means on one end of said fitting for sealing and fitting with the neck of said smaller vessel, the other end of said fitting being provided with first pipe connecting means, means forming first and second open end longitudinal tubes within said fitting, said first tube having a deflector at the inner end extending a substantial distance into said smaller vessel, both first and second tubes extending throughout the length of the fitting,

a longitudinal cylindrical tee-type pipe fitting with second pipe connecting means on either end, said pipe fitting being provided with a stem, and means for possitioning said stem at the mid-point of the pipe fitting, said stem has a similar tube normal to said longitudinal cylindrical pipe fitting and extending away therefrom and therminating in a mating means with the first pipe connecting means end of the tubular solar heat absorber fitting,

said longitudinal cylindrical pipe fitting being provided with a diverting flume at the positioning means so as to form first and second flow channels,

means to align said first longitudinal cylindrical tube on the opposite end of said first flow channel,

means to aligh said second longitudinal cylindrical tube on the opposite end of said second flow channel,

a heat transfer medium and means to conduct the medium under pressure through the first flow channel into said first longitudinal cylindrical tube of the solar absorber fitting, through the outer end of the first longitudinal tube which is provided with a deflector, to deflect the medium against the inner surface of the smaller cylindrical vessel so as to absorb the solar heat from the smaller cylindrical vessel, and from the smaller cylindrical vessel, the heated medium is discharged through the second longitudinal cylindrical tube and out of the opposite end of the second flow channel of the longitudinal cylindrical pipe fitting to an area of reduced pressure.

4,137,904

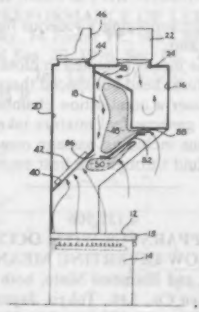
EXHAUST HOOD EMPLOYING A VENTURI SLOT

John O. Dorius, Glendale, Calif., assignor to Elsters, Inc., Hollywood, Calif.

Filed May 25, 1977, Ser. No. 800,444

Int. Cl.[2] F21C *15/08*; F23J *11/00*

U.S. Cl. 126—299 D **6 Claims**



3. An apparatus for use above a cooking surface having a cooking line at one edge of said cooking surface, access being provided to said cooking surface across said cooking line, comprising:

a supply plenum coupled to a source of air;

a partial pressure chamber communicating with said supply plenum through at least a first venturi slot defined in a

wall therebetween to form a low pressure region in part of said partial pressure chamber; and

an exhaust duct coupled to a sink of air in communication with said partial pressure chamber, said exhaust duct having an inlet port disposed in the proximity of a second venturi slot defined in a wall of said partial pressure chamber opposing said first venturi slot, wherein said partial pressure chamber has defined therein a third slot, said third slot disposed in a wall disposed above said cooking line

whereby the rate of exhaust air quantities within said apparatus and the amount of air drawn into said apparatus from the surrounding conditioned space is decreased, thus saving energy.

4,137,905

GASEOUS FUEL BURNERS

Alfred Longworth, Wembley, England, assignor to T. I. Domestic Appliances Limited, London, England

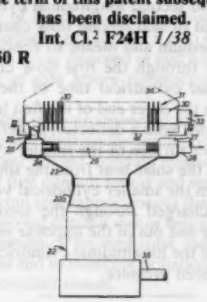
Division of Ser. No. 574,523, May 5, 1975, Pat. No. 4,033,714, which is a division of Ser. No. 350,780, Apr. 13, 1973, Pat. No. 3,897,198. This application Dec. 1, 1976, Ser. No. 746,432

Claims priority, application United Kingdom, Apr. 17, 1972, 17691/72; Oct. 18, 1972, 47926/72; Mar. 21, 1973, 13583/73

The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.

Int. Cl.[2] F24H *1/38*

U.S. Cl. 126—350 R **2 Claims**



1. A heat exchanger assembly comprising in combination

(1) a gaseous fuel mixture burner having a burner mouth,

(2) a plurality of flame ports located in said mouth,

(3) diffuser head means mounted in said mouth for diffusing and cooling said gaseous fuel mixture,

(4) said diffuser head means comprising an assembly of finned pipes having spaces therebetween, said pipes having passages comprising means for circulation of a coolant fluid, the spaces between said finned pipes comprising said flame ports,

(5) duct means for supplying a gaseous fuel mixture to said diffuser head, and,

(6) heat exchange means mounted in close proximity to and above said diffuser head but spaced therefrom for defining with said diffuser a combustion chamber in which combustion of the gaseous fuel mixture takes place, said heat exchange means including passage means for circulation of a coolant fluid through the heat exchanger.

4,137,906

CATHETER APPARATUS WITH OCCLUSION AND FLOW DIVERTING MEANS

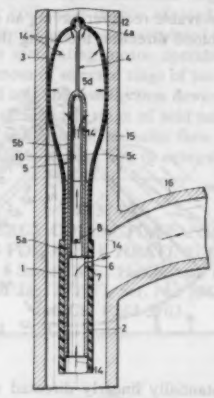
Taichiro Akiyama, and Haruomi Muto, both of Tokyo, Japan, assignors to Koken Co., Ltd., Tokyo, Japan

Filed May 5, 1977, Ser. No. 794,057

Int. Cl.[2] A61B *6/00*; A61M *25/00*

U.S. Cl. 128—2 A **8 Claims**

1. A catheter apparatus with occlusion and flow diverting valve means for selectively directing fluid within a tube, said construction comprising a conduit for said fluid, an opening defined by a wall of the conduit, a resilient bag-like member at one end of said conduit whereby said fluid is adapted to be delivered into the bag-like member, valve means supported in said conduit, connecting means connecting said bag-like member to said valve means, said valve means being slideable longitudinally of said conduit for movement between a position closing said opening and a position opening said opening, said fluid being delivered into said bag-like member when said opening is closed and said bag-like member being thereby



expandable by the pressure of said fluid for engagement of the outer surfaces of the bag-like member with the inner walls of said tube to thereby prevent passage of fluid around and beyond the bag-like member, the movement of said bag-like member and associated connecting means simultaneously sliding said valve means to said position opening said opening whereby said fluid is directed through said opening.

4,137,907

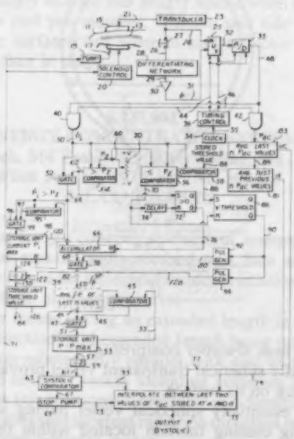
SYSTOLIC PRESSURE DETERMINING APPARATUS AND PROCESS USING INTEGRATION TO DETERMINE PULSE AMPLITUDE

William D. Jansen, Palo Alto; Jerry D. Haney, Sunnyvale, both of Calif.; Christopher C. Day, Newtonville, Mass., and Stephen A. Schneeberger, West Hartford, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 27, 1976, Ser. No. 754,387

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—2.05 M **14 Claims**



1. Apparatus for determining systolic pressure of a living test subject comprising means for applying a selectively change-

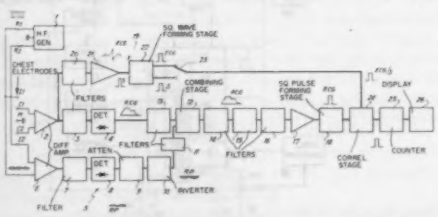
able pressure to the test subject adjacent a blood vessel; means for measuring a fluctuating quantity proportional to a sum, said sum comprising a time-dependent fluctuating component proportional to the amplitude of the pulsatile pressure within the blood vessel plus the selectively changeable pressure applied externally adjacent the blood vessel; means for converting said quantity into a representation of a time derivative of said fluctuating component thereof; means for obtaining the time integral of said time derivative over an interval of predetermined limits in each of successive blood pressure pulses, said interval being the time during which said time derivative representation exceeds a predetermined reference level; means for determining the maximum value attained by successive said integrals as the applied pressure is changed; means for storing a representation of said maximum integral value; means for determining when a said integral is substantially equal to a predetermined fraction of said maximum integral value for an applied pressure greater than the pressure applied when said maximum integral value results; means for reading out said applied pressure corresponding to said integral being substantially equal to said predetermined fraction to said maximum value, said read-out pressure corresponding to the systolic pressure of said subject; means for establishing a threshold level signal representative of the magnitude of substantially only the time derivative representing a systolic rise; means for comparing said time derivative representation of said fluctuating component of said quantity with said threshold level signal while said time derivative representation exceeds said reference level to provide a control signal indicative of whether or not said time derivative representation exceeding said reference level is representative of a valid systolic rise; and means responsive only to a validating indication that a particular said time derivative representation exceeding said reference level is a systolic rise for extending said integral of said particular representation to said maximum integral value determining means and said fraction of maximum integral value determining means.

4,137,908

APPARATUS FOR OBSERVING CARDIAC RHYTHM FREE OF INTERFERING EFFECTS

Jean Degonde, Orsay; Regis Freschard, Meudon-la-Foret, and Louis de Poulepiquet, Orsay, all of France, assignors to Assistance Technique Medicale Serdal S.A. Societe anonyme, Maurepas, France

Filed Feb. 4, 1977, Ser. No. 765,657
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—2.06 R **4 Claims**



1. Apparatus for observing cardiac rhythm free of interfering effects, comprising:

a high frequency electric wave generator;

a pair of current feed electrodes connected in circuit with said high frequency generator for placement on the chest of a patient to be examined at locations suitable for forming a pulmonary rheographic signal and for feeding high frequency current through the patient's body;

a pair of exploratory electrodes for placement on the chest of said patient at locations suitable for picking up a rheocardiographic signal;

first detecting means connected to said exploratory electrodes for detecting and amplifying said rheocardiographic signal;

second detecting means connected to said current feed electrodes for detecting said pulmonary rheographic signal and for amplifying it to substantially the same amplitude at which it appears superimposed on said rheocardiographic signal in the output of said first detecting means, and

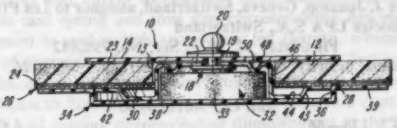
subtracting means connected to the outputs of said first and second detecting means for eliminating said superimposed pulmonary rheographic signal from said rheocardiographic signal and providing the latter as an output which is undisturbed by said pulmonary rheographic signal.

4,137,909

MEDICAL ELECTRODE

Ernet T. Hix, Dayton, Ohio, assignor to NDM Corporation, Dayton, Ohio

Filed Aug. 1, 1977, Ser. No. 820,838
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—2.06 E **6 Claims**



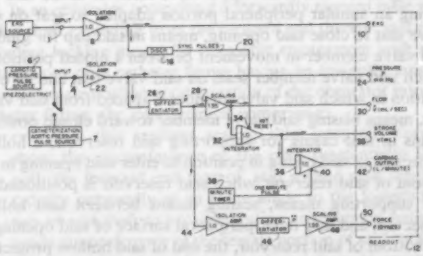
1. In a medical electrode of the type adapted to be adhered to the skin, said electrode having means defining a cavity receiving an electrolyte and having an opening adapted to open to the skin, and having conductive means at the base of said cavity for allowing external connection to said electrolyte, the improvement wherein said means defining a cavity comprises a wall surrounding said base and said electrolyte and means supporting said base and said conductive means in a first position rearward with respect to said wall for an expanded volume of said cavity and for movement to a second position inwardly of said wall to reduce the volume of said cavity and thus press said electrolyte outwardly of said cavity through said opening for engagement with and compression against the skin, said means supporting said base resisting return of said base from said second position to said first position.

4,137,910

METHOD AND MEANS FOR MEASURING CARDIAC PUMPING PERFORMANCE OF LEFT VENTRICLE

Donald H. Murphy, 14 Foster Pl., Sea Cliff, N.Y. 11579

Filed Sep. 30, 1976, Ser. No. 728,207
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 R **11 Claims**



1. A system for measuring and monitoring the pumping performance of left ventricular contraction during systole of a patient's heart, comprising:

pressure responsive means for deriving aortic pressure sig-

nals from a patient's body which are caused by the ejection of said left ventricle;

differentiator means in circuit with said pressure responsive means for differentiating said pressure pulse signals; and

amplifier means in circuit with said differentiator means for amplifying said differentiated pressure pulse signals to obtain data indicative of the blood flow from said patient's left ventricle during systole; and

display means connected to said amplifier means for indicating said pumping performance of left ventricle contraction.

4,137,911

HYDRAULIC APPARATUS FOR BODY CARE

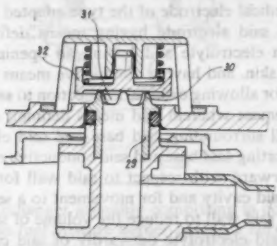
Pierre J. Jousson, Geneva, Switzerland, assignor to Les Produits Associes LPA S.A., Switzerland

Filed May 12, 1977, Ser. No. 796,442

Claims priority, application Switzerland, May 26, 1976, 6625/76

Int. Cl.[2] A61H *9/00*

U.S. Cl. 128—66 **8 Claims**



1. Hydraulic apparatus for body care comprising a casing, a pump mounted in said casing, a hand appliance, a hose connecting the output of said pump to the inlet of said hand appliance, means for supplying liquid to the inlet of said pump, said means comprising a detachable reservoir for a liquid, said reservoir having a flat bottom whereby said reservoir when detached can be set on a flat supporting surface, said bottom having an opening therein, an in-turned rim surrounding said opening, said rim having an essentially cylindrical inner peripheral surface and an inwardly facing annular surface forming a valve seat, a perforate hollow cap positioned over said opening inside said reservoir, a valve member inside said cap having an annular peripheral portion adapted to seat on said valve seat to close said opening, means in said cap for guiding said valve member in movement between a closed position in which said valve member seats on said valve seat and an open position in which said valve member is spaced from said valve seat, means biasing said valve member toward closed position, means in said casing for supporting said reservoir, a hollow projection in said casing in position to enter said opening in the bottom of said reservoir when said reservoir is positioned on said supporting means, sealing means between said hollow projection and said inner peripheral surface of said opening in the bottom of said reservoir, the end of said hollow projection being engageable with said valve member to move it to open position, means providing fluid passage means between said hollow projection and said valve member to permit liquid to flow from said reservoir into said hollow projection and means connecting said hollow projection with the inlet of said pump.

4,137,912

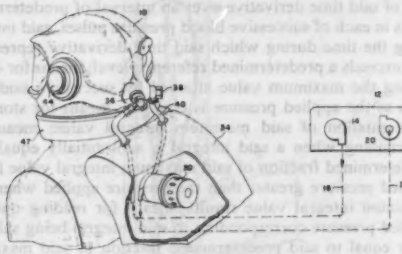
DIVING APPARATUS

Wilbur J. O'Neill, West Severna Park, Md., assignor to Diver's Exchange Inc., Harvey, La.

Filed Nov. 6, 1975, Ser. No. 629,265

Int. Cl.[2] A62B *7/00*

U.S. Cl. 128—142.3 **8 Claims**



1. Diving apparatus wherein the diver is provided with breathing gas via a supply line from a source remote from the diver and exhaust gas is returned back to said source via a return line, the improvement comprising:

(a) spring loaded accumulator means;

(b) said accumulator means being connected in gas communication to said return line at the diver location.

4,137,913

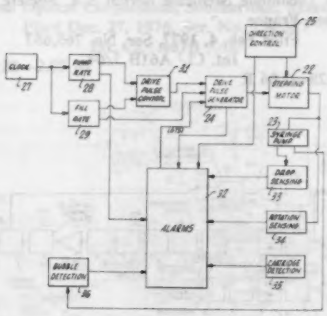
FLUID FLOW CONTROL SYSTEM

Heinz W. Georgi, Del Mar, Calif., assignor to IVAC Corporation, San Diego, Calif.

Filed Feb. 28, 1975, Ser. No. 554,092

Int. Cl.[2] A61M *5/14*

U.S. Cl. 128—214 F **59 Claims**



1. In a system for parenteral administration of liquids at desired flow rates through a feeding tube from a liquid source to a patient, the combination comprising:

syringe means for performing alternate fill and pump strokes to control the flow of liquid through the feeding tube;

motor means for driving said syringe means;

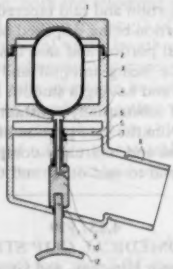
electrical pulsing means for providing output pulses to said motor means at a fill frequency and at a pump frequency to operate said syringe means; and

digital means for automatically varying said pump frequency output pulses as a function of said fill frequency output pulses to achieve the desired flow rate.

4,137,914
AEROSOL INHALATION DEVICE

Kjell I. L. Wetterlin, S Sandby, Sweden, assignor to Aktiebolaget Draco, Sweden

Filed Dec. 10, 1976, Ser. No. 749,326
Claims priority, application Sweden, Dec. 12, 1975, 7514067
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—203 4 Claims

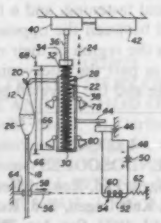


1. Aerosol inhalation apparatus comprising a capsule having a penetrable membrane and containing a unit dose of medication and a unit quantity of pressurized propellant, a housing having inhalation outlet means adapted for insertion into a patient's mouth, first and second capsule retaining means, mounted in said housing, for retaining said capsule, and a perforating needle slideably mounted in said housing and having one end thereof passing through said first retaining means and an opposite end thereof being located in said outlet means, said needle having at said one end piercing means for piercing said capsule and a spray nozzle at said opposite end thereof in said inhalation outlet and a longitudinal capillary tube connected to said nozzle and extending through said piercing means whereby, said needle and said retaining means are arranged in said housing for mutual displacement between said capsule and said needle to cause said needle to perforate said membrane and cause said propellant to propel said medication through said capillary tube and out said nozzle.

4,137,915
FLOW CONTROL FOR AN INTRAVENOUS FEEDING SYSTEM

Dean Kamen, 99 Bulson Rd., Rockville Centre, N.Y. 11570

Filed Jun. 3, 1977, Ser. No. 803,073
Int. Cl.[2] A61M *5/14*
U.S. Cl. 128—214 E 2 Claims

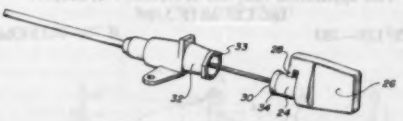


1. A flow control for dispensing fluid intravenously to a patient through a system including an elevated container of a supply volume of fluid and having a flexible hose connected from said container to said patient, said flow control comprising an electrically-operated clamp mounted in normally closed relation on said flexible hose so as to prevent flow therethrough, a clamp-control circuit having a movable switch arm and a cooperating switch contact electrically connected to open said normally closed clamp whenever there is physical contact established between said movable switch arm and said switch contact, a cooperating pair of movement-urging means operatively connected to said switch arm in opposing relation to each other so as to position said switch arm in relation to said switch contact as a function of an overbalance in the urgency of one said means over the other, one said movement-urging means being a spring operatively connected to normally bias said switch arm in ascending movement into a clearance position above said switch contact, the other said movement-urging means being said container of said supply volume of fluid operatively connected to normally bias said switch arm in descending movement into contact with said switch contact, a motor having a threaded rotor depending therefrom serving as a support means for said spring, said threaded rotor having a nut threadably disposed thereon and said spring being connected in a depending supported position from said nut such that in response to rotation of said threaded rotor said nut is either raised or lowered therealong to correspondingly either raise or lower said spring connected thereto, and a timer operatively connected to cause rotational operation of said motor so as to correspondingly cause rotation of said threaded rotor in relation to said nut to successively cause descending movement in said spring and thus also corresponding descending movement in said switch arm connected thereto, whereby a cycle of operation of said flow control includes a first occurring descent in said switch arm which opens said clamp and contributes to flow through said hose emptying said container of fluid and causing corresponding diminishment in the force urgency thereof until there is an overbalance of spring urgency causing ascending movement in said switch arm again re-closing said clamp.

4,137,916
CATHETER PLUG ASSEMBLY

Don M. Killman, Irving, and Thomas P. Robinson, Dallas, both of Tex., assignors to Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 22, 1976, Ser. No. 743,925
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214.4 2 Claims



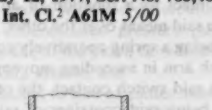
1. In an obturator comprising a forwardly tapered male plug with a shaft extending from the forward end thereof, said plug including locking means for releasable engagement with projecting dogs on a catheter fitting having an inwardly tapered smooth female portion upon insertion of the obturator into the catheter fitting, the improvement comprising:

a relatively thin resilient sealing skirt integrally formed about the circumference of the plug substantially flush with the forward end thereof, said sealing skirt tapering radially outwardly at an acute angle to the longitudinal axis of said shaft to provide sealing engagement with the inside circumference of the female portion of said catheter fitting despite minor dimensional variations in manufacturing said plug and catheter fitting which could otherwise prevent suitable sealing engagement when the locking means of the male plug is engaged with the projecting dogs of the catheter fitting.

4,137,917
SYRINGE FILTER UNIT

Milton J. Cohen, 9201 Persimmon Tree Rd., Potomac, Md. 20854

Filed May 12, 1977, Ser. No. 783,480
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—218 R 7 Claims



1. A multiple filter assembly for use with hypodermic syringes or similar devices comprising:

(a) a filter hub adapted to be interposed between the hub and opening of said syringe and a needle hub, said filter hub including a passageway communicating said syringe opening with the needle hub,

(b) a member movably attached to said filter hub positionable in blocking relation across said passageway, said member having at least two openings therethrough, each of which when positioned in said passageway, permits communication between said syringe opening and said needle hub via said passageway,

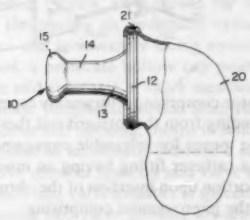
(c) filter means carried by said movable member immediately adjacent said openings,

whereby during the transfer of medicaments into and out of the syringe during preparation and injection, a different one of said openings is positioned in said passageway to insure that foreign materials do not enter the syringe nor are they subsequently injected during discharge of the medicament from the syringe.

4,137,918
MEDICAL BY-PASS DEVICE FOR USE AFTER OSTOMY SURGERY

Clayton Bogert, 118 Lowell Rd., Glenrock, N.J. 07452

Continuation of Ser. No. 642,211, Dec. 18, 1975, abandoned.
This application May 26, 1977, Ser. No. 800,677
Int. Cl.[2] A61F 5/44
U.S. Cl. 128—283 3 Claims



1. Medical by-pass tubular device for insertion into a surgically created orifice in a body organ comprising:

an annular externally enlarged solid base portion at one end of the tubular device having a perimeter provided with an external circumferential groove adapted to receive a disposable bag removably secured to the base portion thereat for receiving and containing body wastes excreted through the tubular device,

an annular externally enlarged relatively rigid solid shoulder portion at the other end of the tubular device comprising a uniformly extending externally smooth surface flared tip adapted to be inserted into said orifice whereby the organ surrounding said orifice will enwrap such shoulder portion at said flared tip,

an annular uniformly extending externally smooth surface solid substantially cylindrical portion, and

an annular uniformly extending externally smooth surface solid tapered portion,

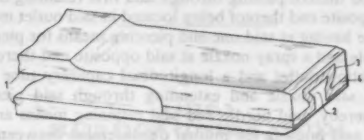
said substantially cylindrical portion being disposed between said shoulder portion and said tapered portion and in turn said tapered portion being disposed between said substantially cylindrical portion and said base portion, and

the tubular device being integral and unitary as well as relatively rigid and having a smooth surface tubular flow path opening of substantially constant and uniform diameter extending from the base portion of the flared tip at the shoulder portion and internally completely therethrough from said one end to said other end thereof.

4,137,919
ELECTROMEDICAL CLIP STRUCTURE

Günter Farin, Tübingen Hirschau, and Günther Posselt, Neuenstetten, both of Fed. Rep. of Germany, assignors to Erbe Elektromedizin KG, Tubingen, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,979
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639956
Int. Cl.[2] A61B 17/36; A61N 3/06
U.S. Cl. 128—303.17 1 Claim



1. In a clip or forceps for application of high-frequency current to biological tissues for coagulation of tissues for surgical purposes, comprising a pair of jaws or branches made at least in part of electrically conducting material having forward and rear ends, the rear ends being mechanically fastened together and insulated from each other, the improvement which consists in that the rear end of one of the jaws or branches has a longitudinal ridge of essentially dovetail profile and the rear end of the other has a longitudinal groove of similar dovetail profile of sufficiently larger dimensions to accomodate an intervening layer, the ridge being positioned within the groove to achieve the mechanical fastening, and a layer of insulating material being provided between the opposed surfaces of the two jaws or branches in the region of their mechanical fastening, occupying at least in part the intervening space between the dovetail profile ridge and the dovetail profile groove.

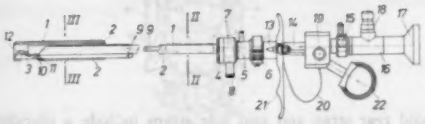
4,137,920
ENDOSCOPES

Ludwig Bonnet, Knittlingen, Fed. Rep. of Germany, assignor to Richarg Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Jan. 17, 1977, Ser. No. 759,718
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1976, 2601802
Int. Cl.[2] A61B 17/32
U.S. Cl. 128—311 5 Claims

1. In an endoscope instrument assembly for treating strictures in the urinary passage, including an outer barrel with a slot along the length having a width at least equal to the diameter of an implant catheter to be introduced through the outer barrel slot for insertion into the bladder, and having a slitting blade attached to an elongated support to be movable axially in

the distal direction relative to the outer barrel for slitting the stricture while under observation with the aid of a telescope having an elongated sighting tube, an inner barrel removably supported within said outer barrel and provided at its distal end with an aperture facing the slot of the outer barrel, a one-piece dual channel guide member removably supported within the inner barrel and having dual channels respectively presented by elongated tubular elements in which are positioned, in radial spaced relation, both the telescope and the support for the slitting blade and wherein the length of the elongated sight tube is approximately equal to the length of said dual channel guide member tubular elements, the improvement comprising: a separate elongated tube insertable in said inner barrel upon removal of said guide member together with said telescope sight tube and the support for the slitting blade, means enabling said separate elongated tube to be rotatable and axially movable within said inner barrel and said separate elongated tube



being provided with an annular blade at its distal end, said separated elongated tube being of such length that when inserted within the inner barrel the annular blade thereon may be positioned within said aperture to work axially and rotatably on the portion of the urinary passage exposed by said aperture of the inner barrel, said telescope sight tube being removable from said guide member and insertable into said separate elongated tube, the inner diameter of said separate elongated tube being approximately equal the outer diameter of said telescope sight tube so the latter may fit within the inner diameter of said separate elongated tube, whereby the guide member together with the telescope sight tube and the support for said slitting blade may be removed from the inner barrel, after slitting the stricture, and replaced by said separate elongated tube, having the annular blade and having the telescope sight tube fitted therein, to enable the urinary passage area around the slit structure to be reamed by the annular blade with the aid of the telescope.

4,137,921

ADDITION COPOLYMERS OF LACTIDE AND GLYCOLIDE AND METHOD OF PREPARATION

Yuzi Okuzumi, Belle Mead; A. Darline Mellon, Bridgewater, and David Wasserman, Springfield, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jun. 24, 1977, Ser. No. 809,737

Int. Cl.[2] A61L *17/00*; A61F *1/24*

U.S. Cl. 128—335.5 **14 Claims**

1. An absorbable surgical suture comprising at least one drawn and oriented filament of a crystalline copolymer of lactide and glycolide containing from about 50 to 75 percent glycolide, said suture having a crystallinity of at least 15 percent, an inherent viscosity of at least 1.0 as determined on a 0.1 percent solution in HFIP at 25° C., a straight tensile and and knot strength of at least 40,000 psi and 30,000 psi respectively, straight tensile strength retention in vivo of at least 40 percent after 14 days, and substantially complete absorption in vivo within about 120 days.

4,137,922

DILATOR FOR CERVICAL CANAL

Robert I. Leininger; Joseph R. Preston, and Brenton R. Lower, all of Columbus, Ohio, assignors to Ortho Pharmaceutical Corp., Raritan, N.J.

Continuation-in-part of Ser. No. 338,697, Mar. 7, 1973, Pat. No. 3,900,033. This application May 21, 1975, Ser. No. 579,631

The portion of the term of this patent subsequent to Aug. 19, 1992, has been disclaimed.

Int. Cl.[2] A61M *29/02*

U.S. Cl. 128—344 **14 Claims**

1. A body canal dilating device comprising a relatively non-elastic, non-expansible, collapsible, inflatable envelope, having two portions, the first said portion in the inflated state having a relatively constant diameter and a length sufficient to occlude a canal having more than one os, and the other of said portions contiguous with the first said portion and being a terminal enlarged bulbous portion having a diameter in excess of said constant diameter in the inflated state, a tubular inserter member entering the first said portion and while inside thereof extending therethrough and into the inside of the other of said portions, a shield located in proximity of the entrance to the first said portion and engaged with said tubular member, said tubular member being adapted to permit entry into said envelope of a pressurizing fluid, and fluid pressurizing means integral with said tubular member at a point external to said envelope.

4,137,923

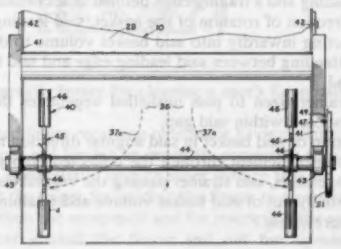
CHAFF SPREADING ATTACHMENT FOR HARVESTERS

Donald G. Druffel, and James E. Druffel, both of Box 104, Colton, Wash. 99113

Filed Mar. 11, 1977, Ser. No. 776,508

Int. Cl.[2] A01F *12/00*

U.S. Cl. 130—27 R **6 Claims**

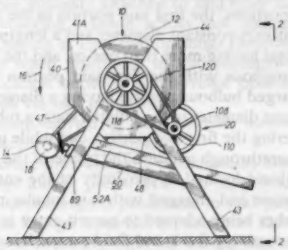


1. A chaff spreading attachment for harvesters of the type used to harvest wheat, peas, beans and the like and which includes a rearward straw or stalk discharge and a separate chaff discharge elevationally below and forward of the straw or stalk discharge to emit chaff entrained in a longitudinal chaff discharge air stream, said spreading attachment comprising:

brackets adapted for mounting the attachment to the harvester adjacent to the chaff discharge;

bearing means on the brackets adjacent the chaff discharge;
fans carried by the bearing means on opposite sides of the chaff discharge and in the path of the chaff discharge air stream;
wherein the bearing means carries the fans for rotation about axes that are transverse to the intended forward path of travel for the harvester;
wherein the fans include blades with the blades of one fan having a pitch opposite the pitch of the other fan so when both fans are rotated in the same direction, the blades will divide and divert the chaff discharge air stream into transverse oppositely moving air currents leading from the chaff discharge; and
drive means for rotating the fans at sufficient velocity to spread the chaff transversely from the chaff discharge the full width of a swath taken by the harvester as it is moved along a field.

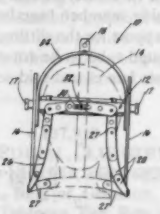
4,137,924
APPARATUS FOR SEPARATING VEGETABLES FROM THEIR SHELLS
Burlen B. White, 114 Hemlock, Lufkin, Tex. 75901
Filed Feb. 11, 1977, Ser. No. 767,800
Int. Cl.[2] B02B *3/08*
U.S. Cl. 130—30 H **16 Claims**



1. Apparatus for separating vegetables from their shells comprising:
a basket defining a volume therein for receiving unshelled vegetables;
means for rotating said basket in an angular direction; agitator means for agitating the unshelled vegetables and causing them to be ejected from their shells, a portion of the ejected vegetable and the emtpy shells collecting toward the outer regions of said basket volume;
a wall of said basket including at least one segment having a leading and a trailing edge defined in accordance with the direction of rotation of the basket, said leading edge projecting inwardly into said basket volume to define a gap extending between said leading edge and said basket wall; and
a strainer sized to pass unshelled vegetables therethrough disposed within said gap;
rotation of said basket in said angular direction moving said strainer element through the collected empty shells and vegetables, said strainer passing the vegetables circumferentially out of said basket volume and retaining the shells therewithin.

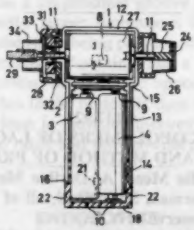
4,137,925
HAIR CUTTING GUIDE
Ralph D. Castillo, 6257 E. 13 St., Wichita, Kans. 67208
Filed Aug. 8, 1977, Ser. No. 822,685
Int. Cl.[2] A45D *24/36*
U.S. Cl. 132—45 R **2 Claims**

1. A hair cutting guide for assisting a hair stylist in cutting various hair styles on a head and at a uniform length, the guide comprising:
(a) a head band received around the top of the head;
(b) a rear strap vertically mounted on the rear of said head band and vertically adjustable on said head band;
(c) a pair of side straps vertically mounted on opposite sides of said head band and vertically adjustable on said head band;
(d) a hair line strap attached to the front of said head band and extending downwardly and along the opposite sides of the head, said hair line strap attached to the bottom of said rear strap; and
(e) a top strap, said top strap extending over the top of the head with the ends of said top strap adjustable attached to the sides of said head band;



said rear strap and said side straps include a plurality of apertures along the length thereof, said apertures received in a threaded bolt in the sides and rear of said head band for adjusting the vertical height of said side straps and said rear strap;
said hair line strap is made of a plurality of flexible links, by adjusting said flexible links various configurations can be formed in providing a desired hair style;
said head band includes an inner band received around the top of the head and an outer band attached to the inner band and extending outwardly therefrom for suspending said side straps and said rear strap.

4,137,926
PORTABLE BATTERY OPERATED MANICURE DEVICES
Cohon Pao, 2, Hoi Ping Rd., 1st. Floor, Hong Kong, Hong Kong
Filed Apr. 28, 1977, Ser. No. 791,992
Claims priority, application United Kingdom, Oct. 22, 1976, 44027/76
Int. Cl.[2] A45D *29/05*
U.S. Cl. 132—73.6 **5 Claims**



1. A portable battery operated manicure device comprising a casing adapted to receive at least one electric battery, a motor mounted in said casing and having a rotatable drive shaft extending axially of said motor, said shaft extending through said casing and having first and second ends projecting outwardly from said casing, electrical connection means including switch means mounted on said casing and operatively connecting said motor to a battery received within said casing, an abrasive disc frictionally mounted on said one end of said drive shaft externally of said casing, a first sleeve means secured to said casing and peripherally surrounding said abrasive disc, said first sleeve means including a stationary protec-

tive ring spaced slightly from said disc for protective engagement by the skin of a finger to prevent contact thereof with said abrasive disc yet permitting the fingernail of said finger to protrude toward said abrasive disc for operative engagement therewith.

4,137,927

COIN STACKING TUBE DEVICE

Hirokuni Matono, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Japan

Filed Dec. 20, 1976, Ser. No. 752,960
Claims priority, application Japan, Dec. 22, 1975, 50-151845
Int. Cl.[2] G07D 9/06
U.S. Cl. 133—1 A **3 Claims**

1. A coin stacking tube device comprising a first support flange; a plurality of parallelly-directed first support pins extending from said first support flange; a second support flange; a like plurality of parallelly-directed second support pins extending from said second support flange toward said first support pins; a like plurality of blades, each blade having a first blade end and a second blade end, said blades being supported on the first blade ends by said first support pins and on the second blade ends by said second support pins so that said blades are slidable on said support pins in a direction transverse the direction of said support pins and are pivotal about said support pins to cause one edge of each blade to overlap onto an adjacent blade to form a tube wall defining internally a continuous cylindrical space of polygonal cross-section for stacking therein a predetermined number of coins, said blades being pivotable about said support pins to permit adjustment of the internal cross dimension of said cylindrical space in accordance with the diameter of the coins to be stacked without causing separation of said overlapped blades; an operative member pivotably supported by one of said support flanges; a like plurality of adjusting pins extending from said operative member to engage said plurality of blades; and spring means slidably urging said blades inwardly along said support pins and said adjusting pins to retain said one edge of each blade overlapping onto said adjacent blade so that pivoting of said operative member causes pivoting of said blades to thereby adjust the internal cross-dimension of said cylindrical space.

4,137,928

APPARATUS FOR CLEANING THE INTERIOR OF TUBES

John S. Sentell, Baton Rouge, La., assignor to Naylor Industries, Inc., Pasadena, Tex.

Filed Sep. 9, 1977, Ser. No. 831,767
Int. Cl.[2] B08B 3/02; B08S 9/04
U.S. Cl. 134—167 C **14 Claims**

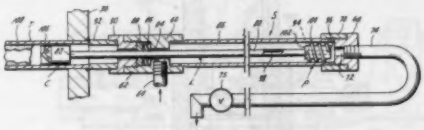
1. An apparatus for cleaning the interior of pipes, tubes and like elongate tubular objects with pressurized fluid, comprising:

(a) spray head means having nozzle means therewith for directing the fluid against the interior of the object for cleaning same;

(b) lance means for transporting said spray head means through the object being cleaned and further for supplying the fluid to said spray head means;

(c) supply cylinder means for supplying the fluid to said lance means; and

(d) piston means mounted with said lance means for causing reciprocating longitudinal movement of said lance means through the object being cleaned, said piston means comprising:



(1) a piston member mounted at an end of said lance means, said piston member having front and rear surfaces for receiving the fluid pressure to cause reciprocating longitudinal movement of said lance means;

(2) said piston member having an opening formed therein for passage of the fluid to said lance means; and

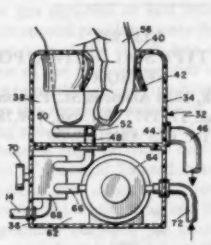
(3) a spiral grooved surface formed on said piston member between said front and rear surfaces thereof for passage of fluid therethrough, said spiral grooved surface causing rotational movement of said lance means and said spray head means during longitudinal movement thereof to assist in cleaning the object.

4,137,929

FINGERNAIL CLEANER

Peter J. Grossman, 6064 Mohler St., San Diego, Calif. 92120

Filed Jul. 29, 1977, Ser. No. 820,082
Int. Cl.[2] B08B 3/02
U.S. Cl. 134—182 **8 Claims**



1. A fingernail cleaner for cleaning a user's fingernails comprising,

an enclosed finger receiving receptacle having an opening in the upper end having an inwardly projecting tubular rim with a substantially smooth inner surface that fits closely around the finger for guiding the finger to a general position within the receptacle and for restricting the spraying of water around the finger and out the opening and adapted for receiving solely the fingers and at least one finger,

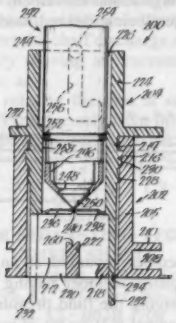
liquid nozzle means positioned in said receptacle for receiving liquid under pressure and jetting a liquid stream solely at a position to engage the ends of the finger and against the underside of the end of the fingernail when positioned in said receptacle,

and drain opening means in the lower part of said receptacle for draining the liquid out of said receptacle.

4,137,930
SINGLE OPERATION NORMALLY CLOSED COUPLING VALVE

William R. Scholle, Corona del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.

Filed Jan. 26, 1977, Ser. No. 762,757
Int. Cl.[2] F16L *29/00*
U.S. Cl. 137—68 R 24 Claims

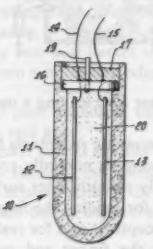


14. In a combination of a fluid valve and coupler therefor, said valve comprising a valve body having an inlet and an outlet and a passage therethrough between said inlet and said outlet and a breakable flow barrier in said passage spaced from said outlet and hermetically sealing said inlet from said outlet, said coupler comprising a coupler body having an inlet end and a channel therethrough and a channel seal normally closing the inlet end of said channel, said seal being movable into said channel to open said channel, said coupler body and channel seal being movable into said valve passage outlet to engage and break said flow barrier with said channel seal to open said passage, and means connected with said valve body within said passage to the side of said barrier toward said passage inlet for moving said channel seal into said channel after the breaking of said barrier to establish a fluid conduit between said passage and said channel.

4,137,931
CONDUCTION TYPE SOIL MATRIC POTENTIAL SENSOR

Harold W. Hasenbeck, 1524 Alameda St., Pomona, Calif. 91767

Filed Jan. 17, 1977, Ser. No. 759,782
Int. Cl.[2] A01G *25/00*
U.S. Cl. 137—78 6 Claims



1. In a matric potential sensor, the combination comprising (a) a housing including a porous wall adapted to be located underground,

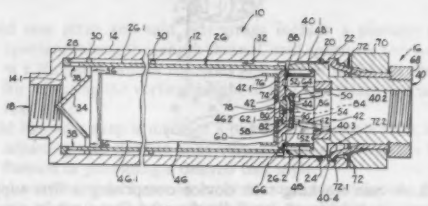
(b) spaced electrodes in the form of elongated metallic plates carried in the housing to be coupled to a source of electrical current, and (c) a mass of granular material in the form of glass beads located to pass electrical current within the housing and between the electrodes so that the current flow will vary as a function of the moisture content of the granular material, said content adapted to vary as a function of the matric potential of the soil surrounding the housing in response to moisture transmission through the porous housing into the surrounding soil,

(d) the electrodes being spaced apart, and the beads located in the current path between the spaced electrodes, the electrodes being elongated and substantially surrounded by said beads which are sized to release substantial moisture retained therebetween when the surrounding soil reaches a selected matric potential, thereby to effect a substantially sharp cut-off of electrical current flow between the plates at that matric potential.

4,137,932
APPARATUS FOR DOSING A FLOWING FLUID

Edgar P. Scragg, 60 Mulder St., Florida Park Extension 3, Florida, Transvaal Province, South Africa

Filed Mar. 4, 1977, Ser. No. 774,575
Int. Cl.[2] G05D *11/00*
U.S. Cl. 137—101.11 6 Claims



6. Apparatus for dosing a flowing fluid with an additive, the apparatus comprising a casing having an inlet and an outlet by means of which the apparatus can be connected into a fluid flow line, the casing including two parts which can be separated to provide access to the interior thereof, a cartridge retaining plate having a bore bounded by a cylindrical surface, the bounding surface of said bore being stepped twice to provide a larger diameter bore portion, a smaller diameter bore portion and an intermediate diameter bore portion between the other two bore portions with an axially facing shoulder between the larger and intermediate diameter bore portions and a further axially facing shoulder between the intermediate and smaller diameter bore portions, and a stop element extending transversely of said bore in said larger diameter bore portion for preventing free passage along said bore of the nozzle of a cartridge containing said additive.

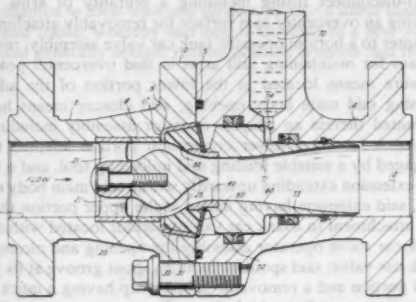
4,137,933
CONTROL VALVE

Jesse L. Culpepper, Houston, Tex., assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 14, 1977, Ser. No. 768,040
Int. Cl.[2] F16K *31/122*
U.S. Cl. 137—219 11 Claims

1. A control valve comprising a tubular housing having a fluid flow conduit therethrough, a stationary member centrally disposed within said fluid flow conduit and supported by radially extending vanes, an annular resilient element abutting said housing and at least partially encircling said stationary member, a variable passageway between said stationary member and said resilient element, piston means slidably engaged within said housing, washer means abutting said resilient element and interposed between said resilient element and said piston means, and a control fluid pressure source for operating

said piston means to cause said washer means to exert a variable compressive force on said resilient element and thereby



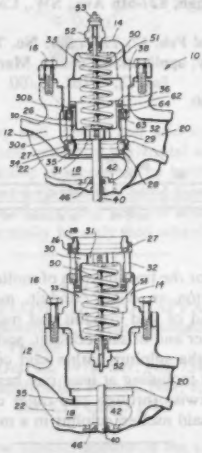
deform said resilient element in such manner as to variably restrict said passageway.

4,137,934

VALVE CONSTRUCTION

Donald D. Rice, and Herbert H. Walton, both of Marshalltown, Iowa, assignors to Fisher Controls Company, Marshalltown, Iowa

Filed Feb. 25, 1977, Ser. No. 772,031
Int. Cl.[2] F16K *1/44, 1/46*
U.S. Cl. 137—270 **3 Claims**



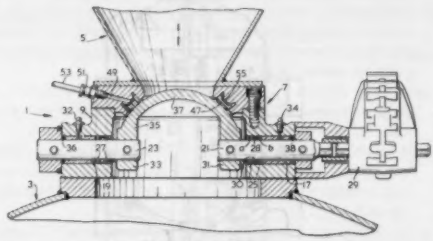
2. A single-ported double seated valve mechanism comprising valve body means having an inlet and outlet communicated by a flow passage and a chamber positioned within said flow passage, a valve bonnet secured to said valve body means, a valve trim assembly fixedly secured to said bonnet and positioned within said chamber, said valve trim assembly further comprising a valve cage having an upper end and a base, said upper end being connected to said valve bonnet, a seat ring connected to said base of said valve cage, a first seal disposed within a recess in said seat ring, a second seal disposed within a recess in said upper end of said valve cage, and a valve stem, a valve plug and a spring positioned within said valve cage, said bonnet and said valve trim assembly being removable from said valve body means as a unit, said bonnet having a portion outwardly extending from said valve body means, said outwardly extending portion of said bonnet being sized to be received within said chamber within said valve body means, whereby said valve body means serves as a support or vise.

4,137,935

VALVE ASSEMBLY

Brian Snowdon, Doncaster, England, assignor to Macawber Engineering Limited, Doncaster, England

Continuation-in-part of Ser. No. 659,031, Feb. 18, 1976, abandoned. This application Oct. 7, 1977, Ser. No. 840,377
Claims priority, application United Kingdom, Feb. 11, 1976, 5380/76
Int. Cl.[2] F16K *3/36*
U.S. Cl. 137—242 **6 Claims**



1. A valve assembly for closing and sealing an inlet which is full of large, granular, dry material, the valve comprising a housing defining the inlet and defining an outlet, the ratio of the outlet diameter to the inlet diameter being at least 1.5:1 thereby allowing unrestricted flow of large granular material through the housing, a closure member having the shape of a part of a spherical shell and being mounted for rotation between a first position in which the inlet is open and a second position in which the inlet is closed, the axis of rotation passing through the centre of the sphere of which the closure member forms a part, said centre lying close to the outlet whereby the ratio of the distance between the outlet and inlet of the valve to the inlet diameter is less than 1.5:1, said housing also defining an annular recess, a deformable, resilient sealing ring being mounted in said recess and secured to the defining surface of said recess except at a central portion thereof to prevent sliding movement of the sealing ring relative to the recess, means for supplying gas under pressure to said central portion of said recess so that gas supplied to said recess while the closure member is in its second position causes the centre of the sealing ring to deform out of the recess into engagement with the convex surface of the closure member to provide a gas-tight seal across the inlet, the sealing ring being sufficiently resilient to retract into the recess on release of gas pressure, and the housing having a shearing edge around the inlet which cooperates with a shearing edge provided on the closure member to shear granules of material located between said edges, the clearance between said edges being less than the clearance between the retracted sealing ring and the closure member to ensure that granules between the closure member and the sealing ring are not large enough to cause wear of the sealing ring, the sealing ring being sufficiently deformable to deform around any of the granules lodged between the sealing ring and the closure member to ensure said gas-tight seal.

4,137,936

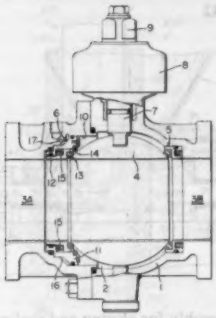
BALL VALVE

Shigeki Sekimoto, Nagoya, and Katsuyuki Suzuki, Yokohama, both of Japan, assignors to Taimei Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,682
Claims priority, application Japan, May 21, 1977, 52/58203
Int. Cl.[2] F16K *3/36*
U.S. Cl. 137—246.22 **7 Claims**

1. In a valve including a valve body having a cavity formed therein and inlet and outlet passages communicating with said cavity, a valve element rotatably mounted in said cavity and valve seats interposed between said valve element and said valve body; the improvement in which at least one of the valve

seats comprises a cylindrical piston slidably fitted in a bore formed at the inner end of said passage, an annular seat holder slidably fitted in said piston, a main seat ring mounted at the inner end of said seat holder, an auxiliary seat ring mounted at the inner end of said piston, a spring means interposed between said piston and said seat holder to resiliently urge the piston outward and to resiliently urge the seat holder inward whereby the main seat ring on the seat holder is normally



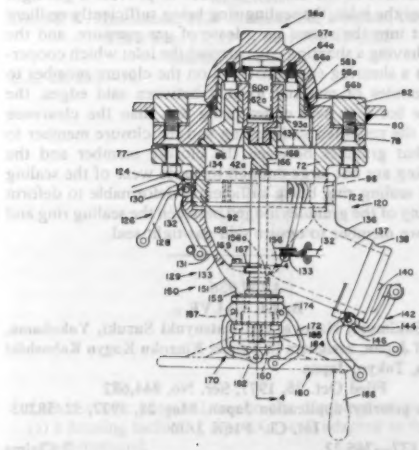
pressed against the valve element while the auxiliary seat ring on the piston is normally kept away from the valve element, and a pressure medium supplying means for feeding pressure medium, when required, to move the piston inward against the action of said spring means to press the auxiliary valve seat ring against the valve element and, at the same time, press the main valve seat against the valve element with increased pressure due to the combined action of the spring and the pressure medium.

4,137,937

ADAPTER FOR BOTTOM OPERABLE TANK CAR VALVE

Charles E. Reedy, Bridgeton, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,451
Int. Cl.[2] F16K *31/44*
U.S. Cl. 137—321 **5 Claims**



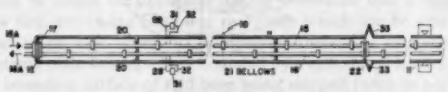
1. An adapter for use with a bottom operable tank car valve assembly comprising: a hollow body portion defining a main body opening; at least one spout extending radially outwardly from said body portion; said spout being hollow and having a spout opening in communication with said main body opening: said body portion including an upper adapter attachment portion having adapter attachment means including a quick connect-disconnect fitting including a plurality of arms, each having an overcenter cam surface for removably attaching the adapter to a bottom operable tank car valve assembly; resilient means for maintaining said arms in said overcenter position; closure means located in the lower portion of the adapter closing said main body opening; said closure means having mounted therein an adapter operator assembly including an operator having a lower connection portion adapted to be engaged by a suitable loading and unloading tool, and a vertical extension extending upwardly within said main body opening, said extension having means at the upper portion thereof for attachment to a tank car valve operator located within said tank car valve operator assembly for opening and closing the tank car valve; said spout including a spout groove at its outer end portion and a removable adapter cap having a quick connect-disconnect fitting including at least one cap arm having an overcenter cam surface adapted to engage said groove to hold said cap in place; said quick connect-disconnect adapter attachment means enabling said adapter to be quickly attached to a tank car valve assembly at an unloading site to quickly load and unload lading; and whereby said adapter and said quick connect-disconnect cap fitting enables quick removal of said cap and quick attachment and removal of an unloading conduit.

4,137,938

METHOD AND APPARATUS FOR TRANSMITTING LIQUID SUPHUR OVER LONG DISTANCES

Robert E. A. Logan, 827-5th Ave., SW., Calgary, Canada (T2P 0N6)

Filed Feb. 17, 1977, Ser. No. 769,545
Claims priority, application Canada, Mar. 2, 1976, 246925
Int. Cl.[2] F16L *53/00*
U.S. Cl. 137—340 **22 Claims**



1. A pipeline for the transmission of molten sulphur comprising in combination an outer conduit, molten sulphur inlet means at one end of said conduit and molten sulphur outlet means at the other end of said conduit, and means to maintain the majority of the sulphur within said conduit, in a molten state, said means including at least one heating liquid conduit extending lengthwise through said outer conduit to maintain the majority of said molten sulphur in a molten state.

4,137,939

HOSE REEL CART

Ho Chow, River Edge, N.J., assignor to Melnor Industries, Moonachie, N.J.

Filed Oct. 11, 1977, Ser. No. 840,971
Int. Cl.[2] B65H *75/34, 75/40*
U.S. Cl. 137—355.27 **10 Claims**

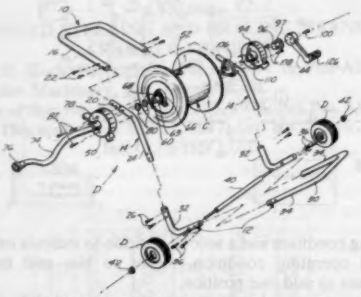
1. A portable hose reel cart comprising:

A. a cart frame comprising a handle portion, a support portion, and a pair of intermediate angled portions, each of said intermediate portions defining in part an opposite side of said frame and connecting said handle portion and said support portion;

B. a reel between said intermediate portions and adapted for rotation about an axis intersecting said intermediate portions, the angle defined by each of said intermediate portions and the lengths of said handle, intermediate and support portions enabling a stable rotatable diposition of said reel above a planar support when said frame is sup-

ported on the planar support by said support and handle portions; and

C. wheels rotatably secured to said support portions and adapted to form with said support portion a stable base for said frame; whereby said cart is movable to a first stable and generally upright reeling position wherein said frame



is supported by said wheels and said support portion, a second stable and generally horizontal unreeling position wherein said frame is supported by both said handle and support portions with said reel being free for rotation, and a third unstable transporting position wherein said frame is supported essentially by only said wheels of said cart.

4,137,940

LIQUID FLOW CONTROL APPARATUS

Yves Faisandier, Montrouge, France, assignor to Societe CM Industries, Paris, France

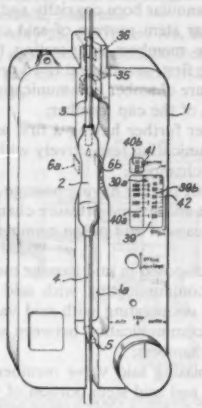
Filed Oct. 22, 1976, Ser. No. 734,769
Claims priority, application France, Nov. 5, 1975, 75 33850
Int. Cl.[2] G05D *7/06*
U.S. Cl. 137—486 **6 Claims**

1. In a liquid flow control apparatus the combination comprising: means defining a liquid flow path along part of which flow takes place in the form of liquid falling drops each of a determined volume; flow control valve means in the said path; a drop detector sensing the passage of each drop in the said part and producing a first signal which is representative of the actual number of drops per unit of time; setting means for producing a second signal which is representative of a desired number of drops per unit of time, said setting means including one movable member and means for converting a displacement of said member into a signal representative of this displacement; and servo control means for comparing said first and second signals to produce an error signal for adjusting the valve means in a sense such as to tend to control the number of drops per unit of time at the desired value, and computation and displaying means including:

(a) linear to exponential signal converting means converting said signal representative of the displacement of said one movable member into the exponential thereof, this converted signal constituting said second signal, and

(b) a second movable member movable, independently of the said one movable member,

(c) means for setting said second movable member in a position representative of the value of the logarithm of the size of each of said drops, said one movable member carrying a first logarithmic scale graduated with respect to the time duration during which the liquid has to be injected and said second movable member carrying a



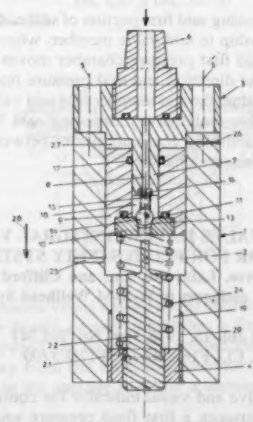
second logarthmic scale graduated with respect to the volume of liquid to be injected, these movable members being arranged so as these scales are juxtaposed each other, whereby the desired number of drops per unit of time can be set by putting the value of the volume of liquid to be injected read off from said second logarithmic scale in registering relation with the value of the time during which this volume of liquid has to be injected, read off from said first logarithmic scale.

4,137,941

DISCHARGE VALVES

Andre Gonin, Saint Etienne, France, assignor to Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement, Loire, France

Filed Sep. 27, 1976, Ser. No. 727,306
Int. Cl.[2] F16K *31/12*
U.S. Cl. 137—508 **1 Claim**



1. A fluid discharge valve comprising:

a body member having an annular central passage opening to one end of said body member;

a cap member sealingly mounted to said one end of said body member, said cap member comprising:

an annular stem portion extending into said annular central passage, and having an inlet passage means;

means for mounting said cap member to said housing;

a pressure responsive piston member moveably mounted in said central passage of the body member, said piston member having an annular bore coaxially and sealingly receiving said annular stem portion of said cap member, said piston and cap members cooperating to define in said central passage first, second and third pressure chambers, said first pressure chamber communicating with said inlet passage means of the cap member;

said body member further having a first and second outlet passage communicating respectively with said second and third pressure chambers;

said piston member further having passage means communicating said first and second pressure chambers; one end of said passage means of said piston member terminating in a valve seat;

a valve member disposed in said passage means of the piston member and communicating with said valve seat, said valve member cooperating with said valve seat for normally closing communication between said first and second pressure chambers;

first means for biasing said valve member interposed said valve member and said stem portion of the cap member, said biasing means being operative only during communication between said first and second pressure chambers, said first biasing means further being substantially relaxed and positioned only to hold said valve member against said valve seat in opposition to the weight of said valve member so that said valve member will not be displaced from said valve seat when said fluid discharge valve is oriented in various positions while said first and second chambers are not communicating;

a rod member mounted in said central passage adjacent said piston member, said rod member having a first portion extending into said second pressure chamber of the body member, said extending first portion being adjustable in space relationship to said valve member;

second means for biasing interposed said piston member and said rod member, said second biasing means being substantially relaxed in the absence of a pressure differential between said first and second pressure chambers, said second biasing means further opposing movement of said piston member in one direction for a predetermined distance; and

means for positioning said first portion of said rod member in space relationship to said valve member, whereby when a pressure in said first pressure chamber moves said piston member in one direction and said pressure reaches a predetermined value, the rod member lifts said valve member from said valve seat thereby opposing said first biasing means for establishing communications between said first and second pressure chambers.

4,137,942

CONTROL VALVE HAVING INTEGRAL VISUAL INDICATOR FOR FLUID SAFETY SYSTEMS

Melvin J. Hargraves, Lafayette, La., and Clifford M. Peters, Longview, Tex., assignors to W-K-M Wellhead Systems, Inc., Shreveport, La.

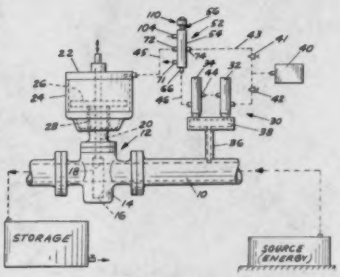
Filed Jul. 15, 1976, Ser. No. 705,747
Int. Cl.[2] F16K *37/00*; F17D *3/00*
U.S. Cl. 137—557 **10 Claims**

1. A control valve and visual indicator for controlling fluid communication between a first fluid pressure source and an actuator and visually indicating the operating condition of the actuator, said control valve and visual indicator comprising:

(a) a hollow housing having an elongate slide valve mounted within said housing for longitudinal movement and having one end extending outwardly of the housing,

(b) said slide valve having a means on said one extending end outwardly of said housing adapted to be manually gripped for movement of said slide valve in a longitudinal direction, means urging the slide valve to a seated position thereof, means to temporarily hold the slide valve in one position when said means to grip is manually gripped and said slide valve is moved to said one position against the bias of said urging means, port means in said housing having one end in fluid communication with said slide valve and having its other end responsive to a sensed fluid pressure, said means to temporarily hold said slide valve being released upon application of sufficient fluid pressure to overcome said urging means,

(c) visual indicator means mounted on said means to grip movable between one position to indicate a normal operating condition and a second position to indicate an abnormal operating condition, means to bias said indicator means to said one position,



(d) a passageway longitudinally through said slide valve in fluid communication adjacent one end with said port means under all conditions of operation when a predetermined high fluid pressure sufficient to overcome said urging means is reached, and in fluid communication adjacent the opposite end thereof with said visual indicator means, and

(e) means cooperatively connected with said indicator means and said passageway to actuate said indicator means upon application of a predetermined high fluid pressure at any time through said port means to said slide valve to overcome said urging means to permit movement of said indicator means to said second position, said indicator means being visually recognized in both positions.

4,137,943

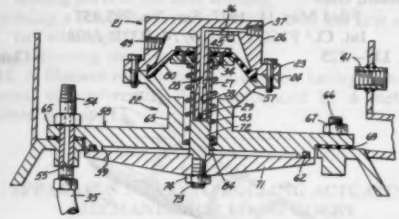
DIAPHRAGM VENT VALVE FOR FLUID STORAGE TANK WITH VAPOR RECOVERY SYSTEM

Michael B. Rath, 4789 Detroit Rd., Lorain, Ohio 44054

Filed Aug. 31, 1977, Ser. No. 829,220
Int. Cl.[2] F16K *45/00*
U.S. Cl. 137—587 **8 Claims**

5. A vent valve assembly comprising a hollow upper body member, a hollow lower body member and flexible diaphragm means securely interposed therebetween to provide a gas-tight partition between said upper and lower body members; said upper body member having a first passage to supply pressurized gas to the interior thereof, and a second passage for said gas exiting said upper body member, in valved communication with said first passage; valve means coaxially longitudinally disposed within said lower body member, said valve means including a disc, and T-shaped stem secured thereto; said flexible diaphragm being centrally secured to said stem which is movable with said diaphragm; a guide projecting centrally from said upper body, said guide having longitudinal and transverse bores in open internal communication, said stem being reciprocably disposed on said guide; and biasing means

in said lower body member to sealingly bias said disc against the lower surface of said lower body member, said biasing means being responsive to a predetermined pressure on said



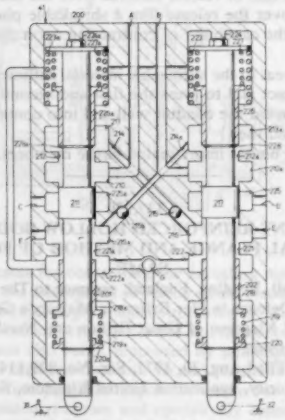
diaphragm means so as to place said first passage means, said transverse and longitudinal bores and said second passage means in open fluid communication with each other.

4,137,944

COMBINED STEERING AND BRAKING MEANS FOR CRAWLER TRACTOR

George P. Koch, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Division of Ser. No. 640,767, Dec. 15, 1975, Pat. No. 4,037,677.
This application Mar. 2, 1977, Ser. No. 773,502
Int. Cl.[2] F15B *13/02*
U.S. Cl. 137—596 **8 Claims**



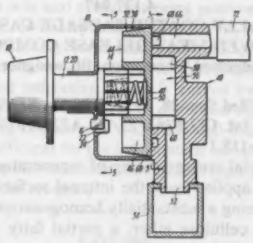
1. In a hydraulic control valve:
a housing having a pair of bores therein;
a pair of independently actuatable valve spools, one for each bore, in said housing, each valve spool having a land thereon and being biased into a neutral position and selectively movable therefrom to other positions;
a pair of main inlet ports, one for each bore;
two pairs of pressure ports, each pair of pressure ports including a first and a second pressure port associated with one bore; and
a pair of passages, each passage communicating between the main inlet port of one bore and the second pressure port of the other bore;
a main outlet port in said housing connected to the second pressure ports of both bores;
each valve spool when in neutral having its land interposed between the main inlet port and the first pressure port of its associated bore thereby preventing communication therebetween;
each valve spool when moved from neutral to another position decreasing communication to its associated second pressure port and moving the land interposed between the main inlet port and the first pressure port thereby enabling communication between its associated main inlet port and its associated first pressure port.

4,137,945

GAS TAP

Ronald G. Cutts, Highett, Australia, assignor to W. A. Deutsher Pty. Ltd., Moorabbin, Australia

Filed May 25, 1977, Ser. No. 800,249
Claims priority, application Australia, Jun. 1, 1976, 6126/76
Int. Cl.[2] F16K *5/10, 35/02*
U.S. Cl. 137—625.46 **10 Claims**



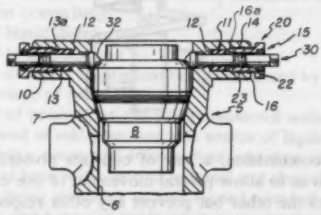
1. A gas tap comprising: a body portion, a housing, metering means and a control device, wherein said body portion includes an inlet port in gas communication with an inlet chamber and an outlet port, said metering means being adapted to be in gas communication with said inlet chamber and being operable, responsive to movement of said control device, to govern the amount and rate of gas flow from said inlet chamber to said outlet port, said inlet chamber of said body portion comprising an elongated central portion, arcuate portions at each end of said central portion, and a further smaller portion separate from but in gas communication with said central elongated portion.

4,137,946

PRESSURE VESSEL NUT AND LOCK SCREW ARRANGEMENT

Philip P. Hardcastle, Houston, Tex., assignor to Equipment Renewal Company, Houston, Tex.

Continuation of Ser. No. 768,276, Feb. 14, 1977, abandoned.
This application Dec. 1, 1977, Ser. No. 856,495
Int. Cl.[2] F16L *55/00*
U.S. Cl. 138—103 **3 Claims**



1. In a pressure vessel having a longitudinal bore intersecting at least one lateral passage which has a first shoulder facing inwardly toward the bore and a second shoulder facing outwardly away from the bore, the invention comprising an arrangement in the passage to retain a member within the bore including:
a. an elongated shaft for extending through the passage and having threads intermediate its inner and outer ends;
b. said inner end of said shaft being formed to provide a

surface for engaging the member in the vessel bore and an annular shoulder within the lateral passage;

c. packing abutting the outwardly facing second shoulder of the passage for sealing between said shaft and the passage; and

d. a nut having external threads for engaging threads on the passage and internal threads for engaging said threads on said shaft whereby said nut may be moved against said packing to form a seal between said shaft and the passage.

4,137,947

INTERNALLY COATED SAUSAGE CASING WITH IMPROVED MEAT RELEASE COMPOSITION

Douglas J. Bridgeford, Champaign, Ill., assignor to Teepak, Inc., Chicago, Ill.

Filed Sep. 28, 1977, Ser. No. 837,080
Int. Cl.[2] F16L *11/02;* A22C *13/00*
U.S. Cl. 138—118.1 **12 Claims**

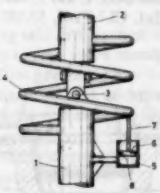
7. An artificial sausage casing of regenerated cellulose having a coating applied over the internal surface of the casing, said coating being a substantially homogeneous admixture of a water-soluble cellulose ether, a partial fatty acid ester of a polyhydric alcohol selected from the group consisting of sorbitan and mannitan, and a polyalkylene glycol ether having the formula $RO(-C_2H_4O)_nH$ wherein R represents long chain alkyl radicals having 8 to 16 carbon atoms and n is an integer from 4 to 40.

4,137,948

INTERMEDIATE CONDUIT BETWEEN TWO PIVOTALLY CONNECTED CONDUITS

Willem J. Van Heijst, Monte-Carlo, Monaco, assignor to Single Buoy Moorings Inc., Fribourg, Switzerland

Filed Sep. 12, 1977, Ser. No. 832,409
Claims priority, application Netherlands,
Int. Cl.[2] F16L *35/00, 55/00*
U.S. Cl. 138—120 **6 Claims**



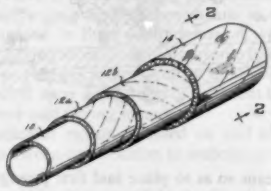
1. In combination, a pair of conduits pivotally interconnected so as to allow pivotal movement of one conduit with respect to the other but prevent any other respective movement, a rigid elastic intermediate conduit which at one end is secured to and communicates with the interior of one of said conduits and at its other end is secured to and communicates with the interior of the other of said conduits, the straight line distance between the ends of the intermediate conduit being substantially less than the length of the intermediate conduit, and damping means extending between one of said pair of conduits and said intermediate conduit at at least one point on said intermediate conduit spaced between the ends of said intermediate conduit.

4,137,949

METHOD OF MAKING A FIRE RETARDANT CONDUIT

Peter J. Linko, III, Cincinnati, and Stanley C. Harrier, Terrace Park, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed May 11, 1977, Ser. No. 795,857
Int. Cl.[2] F16L *11/12, 9/14;* B32B *1/08*
U.S. Cl. 138—125 **3 Claims**



1. A method for making a fire-retardant conduit comprising the steps of:

providing a plurality of first cloth members made from carbon fibers and preimpregnated with a binder;

applying each of the plurality of first members in sequence about a conduit wall to provide a first fire-retardant barrier portion;

providing at least one of a second cloth member made from glass fibers and preimpregnated with a binder;

applying the glass fiber member about the first member to provide a second fire-retardant barrier portion;

applying a film of release material over the second portion;

applying over the release film a shrinkable plastic material having the capability of contracting upon the application of heat;

applying heat to the shrinkable material sufficient to cause it to contract and to press the first and second barrier portions toward the conduit wall and into contact with each other; and then

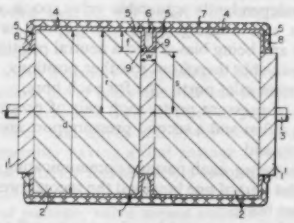
curing the binder impregnated in the members.

4,137,950

FILAMENT-REINFORCED HOLLOW BODY WITH INTERNAL FLANGE AND METHOD OF FORMING SAME

Harry Briscall, Reading, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, United Kingdom

Filed Aug. 30, 1977, Ser. No. 829,114
Claims priority, application United Kingdom, Sep. 14, 1976, 38075/76
Int. Cl.[2] F16L *9/16;* B65H *81/00*
U.S. Cl. 138—172 **13 Claims**



1. A method of fabricating a filament-reinforced resin-impregnated hollow body having at least one internal circumferential flange comprising:

winding a separate first filamentary winding on each of two mandrel portions, the filament being wound across at least

one end of each said portion so that the winding extends stably inwards towards the axis of each mandrel portion;

with said ends spaced apart opposite one another, winding a second filamentary winding between said inwardly extending parts of the first winding;

winding a third filamentary winding over the first and second windings;

and removing the mandrel portions.

13. A filament-reinforced hollow body having at least one internal circumferential flange produced by a method as claimed in claim 1.

4,137,951
APPARATUS FOR CONTROLLING ACTUATING MECHANISM OF LOOM DOBBY

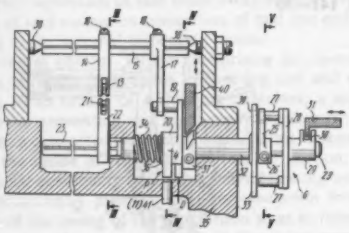
Alexandr A. Kazurov, Tretya linia, 13, kv. 175; Leonid M. Pevzner, Tretya linia, 13, kv. 6; Alexandra E. Mikhalina, Nagornaya ulitsa, 32, korpus 3, kv. 44, all of Moscow; Nikolai P. Kachkov, ulitsa 50 let Oktyabrya, 18, kv. 42, Cheboxary Chuvashskoi ASSR; Georgy S. Lapshinov, ulitsa Kalinina, 44, Cheboxary Chuvashskoi ASSR, all of U.S.S.R.; Nikolai S. Sedov, prospekt Lenina, 51, kv. 25, Cheboxary Chuvashskoi ASSR; Nikolai P. Kainkov, ulitsa Stroitelei, 9, kv. 31, Losino-Petrovsky Moskovskoi oblasti, and Stanislav M. Anisimov, ulitsa Gagarina, 12, kv. 15, Cheboxary Chuvashskoi ASSR, all of U.S.S.R.

Filed Mar. 22, 1977, Ser. No. 780,188

Claims priority, application U.S.S.R., Mar. 31, 1976, 2334101

Int. Cl.[2] D03C *1/00*

U.S. Cl. 139—68 **9 Claims**



1. An apparatus for controlling the actuating mechanism of a loom dobby for raising and lowering heald means, comprising: support means, logic means supported by said support means for movement between normal and displaced locations, said logic means also being supported by said support means for movement between first and second positions in each of said locations, first program-responsive means for responding to a predetermined program and operatively connected with said logic means for situating the latter either in said first or said second position thereof both when said logic means is in said normal location thereof and when said logic means is in said displaced location thereof, output means operatively connected to actuating means of the loom dobby cooperating with said logic means to be controlled thereby, said logic means when in its normal location providing in its first and second positions first and second types of operation, respectively, of said output means and said logic means when in its displaced location providing in said first and second positions thereof, said second and first types of operation, respectively, at said output means, so that the information transmitted to said output means through said logic means from said first program-responsive means is reversed when said logic means is in its displaced location as compared with the information transmitted when said logic means is in its normal location, sensing means for sensing the position of heald means, controlled by a mechanism actuated by said output means, moving means operatively connected with said sensing means for moving the latter cyclically along a predetermined path of movement, second program-responsive means for responding to a predetermined program and operatively connected with said sensing means for situating the latter in either one of at least a pair of predetermined positions, indicating means adapted to be operatively connected with said heald means controlled by the mechanism actuated by said output means for indicating the actual position of said element, said indicating means having, according to the actual position of said element, either a registering position in register with the position of said sensing means or a non-registering position out of the register with the position of said sensing means, and said indicating means being supported for movement by said support means and being situated out of the path of movement of said sensing means when said indicating means has said registering position with respect thereto and in the path of movement of said sensing means when said indicating means is in a non-registering position with respect to said sensing means, so that when said indicating means is in said non-registering position said indicating means will be moved by said sensing means, said indicating means being operatively connected with said logic means for moving the latter from said normal to said displaced location thereof when said indicating means is moved by said sensing means, and delay means cooperating with said logic means for releasably holding the latter is said displaced location thereof for an interval sufficient for the information transmitted by said first program-responsive means though said logic means to said output means to be reversed.

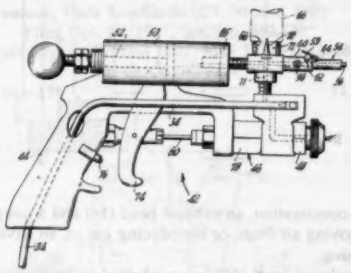
4,137,952
APPARATUS FOR SPRAYING DIVERSE FLUIDS WITHIN THE CAB OF A VEHICLE

Louis Rendemonti, 700 New York Ave., Point Pleasant, N.J. 08742

Filed Jul. 5, 1977, Ser. No. 812,775

Int. Cl.[2] B65B *1/04*

U.S. Cl. 141—27 **4 Claims**



1. Apparatus for dispersing diverse fluid substances within a vehicle interior comprising:

a source of liquid disinfectant;

a source of pressurized gas;

said source of liquid disinfectant being connected by a hose to said source of pressurized gas;

said source of pressurized gas being connected with a first terminal end of said hose, and said source of liquid disinfectant being connected intermediate said first terminal end of said hose and a second terminal end thereof;

a dispenser being provided on said second terminal end of said hose and being operable upon manual actuation to dispense vaporized liquid disinfectant through said hose under the pressure of said pressurized gas;

means mounted on said dispenser head for storing a measured amount of liquid deodorant and generally comprising a cylinder mounted on said dispenser, said cylinder being provided with a plunger arrangement for drawing liquid into said cylinder through a tube;

a plurality of liquid deodorant containers being provided with discharge outlets;

a portion of said tube being formed to penetrate into each of

the said discharge outlets of said liquid deodorant containers, whereupon liquid deodorant from one of said containers is drawn into said cylinder upon the withdrawing of said plunger while said free end of said tube is engaged within a said discharge outlet of a liquid deodorant container; and

said means for storing liquid deodorant being formed with a passageway communicating said liquid deodorant with the pressurized gas and vaporized disinfectant passing through said dispenser, whereby said dispenser is operable upon the actuation thereof to spray both disinfectant and deodorant dispersed in and aspirated by the pressurized gas passing through and discharging from said dispenser.

4,137,953

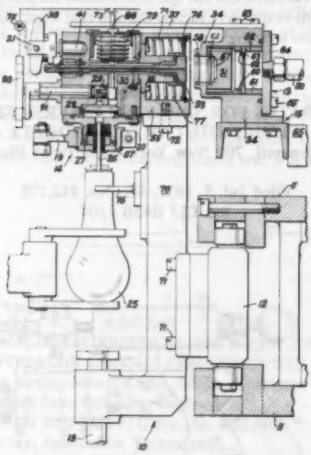
EXHAUST HEAD

Ernest E. Yeo, Wenham, Mass., assignor to Swanson-Erie Corporation, Erie, Pa.

Filed Oct. 13, 1977, Ser. No. 841,969

Int. Cl.[2] B65B *31/04;* **G01M** *3/02;* **H01J** *9/38, 9/42*

U.S. Cl. 141—65 **7 Claims**



1. In combination, an exhaust head (14) and a coupling (13) for removing air from, or introducing gas to, an envelope (25) comprising,

said exhaust head (14) being adapted to be supported on a moveable member (12) of a machine (10) having a plurality of dwell positions thereon,

said exhaust head (14) having resilient means (27) for receiving a tubular member (26) attached to said envelope (25),

a coupling (13) adapted to be supported on said machine at said dwell position,

said exhaust head (14) having a poppet valve having a generally cylindrical head (32) extending therefrom,

said coupling (13) having a gland (35) with a hollow cylindrical cavity therein receiving said poppet valve head (32),

and means on said machine to move said coupling (13) toward said exhaust head (14),

and means in said gland (35) to connect a vacuum head to said coupling (13) when said poppet valve head (32) is received in said gland,

said poppet valve head (32) has an elongated stem (36) attached to it extending outward from said exhaust head,

a rocker lever (38) is supported on said exhaust head (14) engaging said stem,

and rod means on said coupling (13) engaging said rocker arm holding said poppet valve head (32) open, connecting said coupling to said tubular member (26) and spring means on said valve stem (36) urging said poppet valve head (32),

a rotary valve means (29) is connected in series with said poppet valve head,

actuating means (92) connected to said rotary valve, and means to engage said actuating means (92) to rotate said rotary valve and disconnect said coupling (13) from said envelope (25) when said exhaust head is moved to position on said machine,

a diaphragm means (79) is connected to said tube on said machine,

said diaphragm means (79) having means (86, 73, 75) to engage an actuating member for disengaging said poppet valve head from said rocker arm when said diaphragm is extended during evacuation of said envelope.

4,137,954

LIQUIDS CONTAINERS

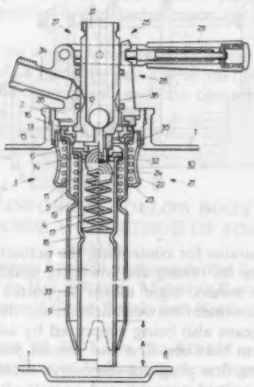
Karl H. Brill, Oftersheim; Gerhard Schenk, Brühl-Rohrhof, and Rudolf Weinlich, Monsheim, all of Fed. Rep. of Germany, assignors to Enzinger-Union-Werke AG, Mannheim, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,175

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639918; Oct. 13, 1976, 2646092

Int. Cl.[2] B65B *3/18;* **B67C** *7/00*

U.S. Cl. 141—90 **13 Claims**

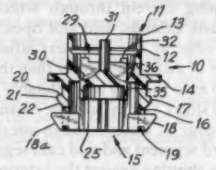


1. A liquids container provided with duct means for the ingress of fluids into and egress of fluids from the container, the container comprising a head portion, a base portion, and side walls connecting said head and base portions, and the duct means being secured to and extending inwardly of the container from said head portion and comprising a first pipe defining a first conduit communicating with the interior of the container in the region of said head portion, a second pipe arranged concentrically inwardly of the first pipe and defining a second conduit communicating with the interior of the container in the region of said base portion, a third pipe arranged concentrically inwardly of the second pipe and defining a third conduit communicating with the interior of the container in the region of said base portion, the third conduit communicating with the interior of the container at a greater distance from said head portion than the second conduit, and respective valve means associated with each of the pipes to close the conduits, the valve means being operable to open the conduits thereby to permit the ingress of fluids into and egress of fluids from the container through the conduits.

4,137,955
TAMPERPROOF SHIPPING VALVE

Richard W. Carlson, Warwick, N.Y., assignor to International Paper Company, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,831
Int. Cl.[2] B65B 3/04; F16K 13/04
U.S. Cl. 141—349 12 Claims



1. A one-piece shipping valve comprising:

a. an integral top portion comprising an open-ended casing and a means for sealably connecting one end of said casing to an external dispensing means, the dispensing means including a check valve;

b. a break-away member comprising a base and a check valve releasing means thereon, said check valve releasing means extending toward said one end of said casing of the top portion and said break-away member being positioned within said casing of said top portion and integrally connected to the inside of said casing through a break-away sealing surface, the sealing surface being rupturable, so as to permit separation of said break-away member from the inside of said casing, on connection of said one end of the casing to the external dispensing means;

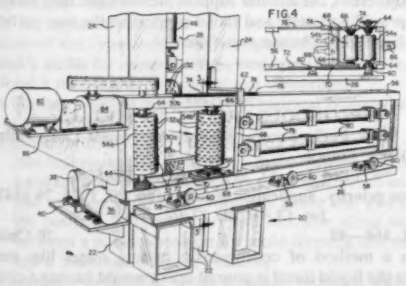
c. an integral bottom portion comprising an open-ended casing; a means for sealably connecting one end of said casing to an orifice of a shipping container; a stopping means for preventing said break-away member from falling into a connected shipping container after its separation from the inside of the casing of the top portion; and a means for positioning said check valve releasing means of said break-away member after its separation from the inside of the casing of the top portion so as to release the check valve of a connected external dispensing means; and

d. an intermediate member integrally linking the other end of the top casing and the other end of the bottom casing, said connection maintaining a channel between the two portions.

4,137,956
WOOD INCISOR

Lloyd H. Toberg, 11120 SW. Industrial Way, Tualatin, Oreg. 97062

Filed Jun. 27, 1977, Ser. No. 810,619
Int. Cl.[2] B27E 9/04
U.S. Cl. 144—2 J 7 Claims



1. A wood incisor for forming a plurality of spaced perforations in the faces of rectangularly cross-sectioned boards preparatory to the preservative treatment of the boards comprising:

(a) a mounting platform;

(b) paired first drums rotatably journaled on said mounting platform on mutually parallel first axes which are laterally separated from each other;

(c) paired second drums rotatably journaled on said mounting platform on mutually parallel second axes which are laterally separated from each other and extend perpendicularly to said first axes;

(d) said first pair of drums and said second pair of drums being located such that an elongate board can be moved longitudinally between said first pair of drums and said second pair of drums;

(e) said drums having a plurality of outwardly protruding teeth;

(f) said first and said second pairs of drums each including a driven drum and an idler drum, one of said drums in each pair being translatable toward or away from the respective other drum in said pair for adjustment of the lateral separation therebetween;

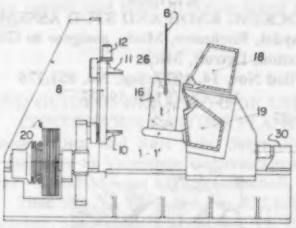
(g) means for rotatably driving said driven drums; and

(h) carriage means for mounting at least one of said pair of drums and its associated driving means; said carriage means being freely slidably mounted on said mounting platform for lateral movement perpendicularly to the axis of said one pair of drums for permitting movement of said one pair of drums laterally in unison such that the individual drums of said one pair of drums maintain a predetermined separation with respect to each other despite the movement of said carriage means.

4,137,957
WOOD STOCK SUPPORT CONSTRUCTION FOR A BLADE HOLDER AND BAR CARRYING UNIT OF A VERTICAL TYPE WOOD SHEARING MACHINE

Angelo Cremona, Viale Lombardia 275, Monza, Italy

Filed Oct. 14, 1977, Ser. No. 842,530
Claims priority, application Italy, May 12, 1977, 23486 A/77
Int. Cl.[2] B27C 1/14
U.S. Cl. 144—178 12 Claims



1. In a vertical wood shearing machine having a substantially vertical support table for holding wood stock, clamping means connected to the support table for securing the wood stock in an operative position on the support table, a cutting carriage having a side facing the support table including a blade-holding unit and a bar-carrying unit which cooperate to cut sheets of wood from the wood stock, means connected to the cutting carriage for moving it toward and away from the support table, and means connected between the support table and the cutting carriage for moving the support table and the cutting carriage in a vertical direction and in a reciprocal relationship to each other for cutting sheets of wood from the wood stock, the improvement comprising: at least one support arm connected to the carriage on the side of the carriage facing the support table and extending outwardly toward the support table for pushing the wood stock against the support table when the carriage is moved toward the support table and for supporting the wood stock from below when the wood stock

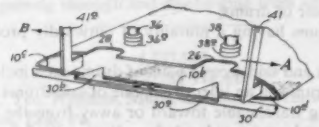
is removed from the support table to be rotated about its longitudinal axis.

4,137,958

POLYPROPYLENE BAG FOR USE IN AN AUTOMATIC FILLING PROCESS

Jerome L. Golby, and Steven Goodin, both of Portland, Oreg., assignors to Golby Bag Company, Inc., Portland, Oreg.

Filed Nov. 15, 1976, Ser. No. 741,900
Int. Cl.² B65D *27/32*
U.S. Cl. 150—1 **3 Claims**



1. A bag for use in an automatic bag opening apparatus, said apparatus including a pair of spaced-apart clamping fingers, means for exerting a side-separating force on the bag, and a pair of spreadable positioning arms, said bag comprising;

a flexible container formed by a joined sheet of bag material defining first and second sides and a bag width, a closed end and an open end, said sides having opposed nongusseted longitudinal edges extending from said open end to said closed end for permitting said flexible container to assume an unfilled substantially flat profile; and

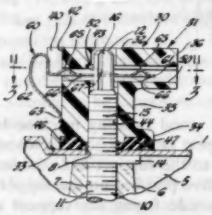
notch means formed on said first side adjacent to said open end for receiving therethrough the spaced-apart clamping fingers so that said fingers may clamp said second side adjacent said open end for holding a substantial portion of said second side adjacent said open end substantially flat when said bag is positioned horizontally, thereby permitting a side-separating force to be applied to said first side to allow the positioning to be inserted into the bag through said open end.

4,137,959

SELF-LOCKING KNOB AND STUD ASSEMBLY

Wieslaw S. Zaydel, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1977, Ser. No. 851,276
Int. Cl.² F16B *39/00*
U.S. Cl. 151—27 **3 Claims**



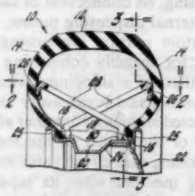
1. A self-locking knob and stud assembly for securing an apertured first member to a second member, said self-locking knob and stud assembly including a stud fixed at one end to the second member and having a shank extending from the second member through the apertured first member, said shank having an externally threaded portion extending a predetermined distance from the second member and a free end portion of substantially Z-shaped in cross-section providing opposed sets of slant L-shaped portions each of which includes a flat chord segment connected to a radial cam segment, a knob having an axial extending bore therethrough, at least one portion of said bore extending from one end of said knob having internal threads in threaded engagement with said threaded portion of said stud to effect attachment of the first member to the second member, said knob having a transverse slot therethrough intersecting said bore adjacent to the opposite end of said knob and, a retainer means, having a return bent spring portion and an integral retainer body portion that is slidably received in said slot, said retainer body portion having a longitudinal extending through slot opening therein through which said free end portion of said shank extends, said slot opening defined by a semi-circular rim edge at one end next adjacent said return bent spring portion of a diameter larger than the outside diameter of said shank so as to slidably and rotatably receive said free end portion of said shank and by an edge means at its other end having a cam tab edge of a size to be in interference relationship with said chord segment and said cam segment, said return bent spring portion abutting against the exterior of said knob to normally bias said retainer body portion in a direction whereby said cam tab edge is positioned to project into said bore so as to be engaged by said chord segment and said cam segment upon rotation of said knob.

4,137,960

RUN-FLAT TIRE HAVING INTERNAL SUPPORT MEANS

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1977, Ser. No. 848,948
Int. Cl.² B60C *5/00, 17/00*
U.S. Cl. 152—158 **4 Claims**



1. In a pneumatic tubeless tire including a carcass having an outer tread surface, oppositely disposed sidewalls, a bead adjacent each inner sidewall end, and an annular opening between the beaded ends, for mounting on a vehicle wheel having rim flanges formed on oppositely disposed sides thereof for retaining the beaded ends in sealing engagement therewith when the tire is inflated, the improvement comprising at least one annular support member attached to the inner surface of one of the sidewalls at substantially the widest portion thereof, and a plurality of spaced ribs, each having one end thereof integrally formed with the annular support member and extending across the tire from the annular support member to a predetermined location on the inner surface of the other sidewall and being attached thereto, the annular support member and the plurality of ribs providing lateral and radial support to the tire, particularly when the tire becomes deflated.

4,137,961

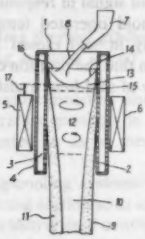
CONTINUOUS CASTING OF METALS

Michel Mola, Paris, France, assignor to Creusot-Loire Vallourec, Paris, France

Filed Jan. 17, 1977, Ser. No. 759,658
Claims priority, application France, Jan. 20, 1976, 76 01411
Int. Cl.² B22D *27/02, 27/08*
U.S. Cl. 164—49 **10 Claims**

1. In a method of continuously casting metal like steel, wherein the liquid metal is poured into a mould having a circular cross section and a substantially vertical axis, the wall of the mould is continuously cooled, the liquid metal is rotated in the mould by an electromagnetic field, and the solidified bar is

continuously withdrawn at the bottom of the mould, the improvement comprising, the steps of, supplying the mould with a liquid metal stream which is inclined and eccentric with respect to the mould axis, directing said stream so that when it strikes the surface of the liquid metal in the mould, it has a component substantially tangential to a geometrical circle extending through the point of impact and centered on the mould axis, thus producing at the surface of the liquid metal a meniscus which causes a uniform peripheral skin to form at the top of the bar, and simultaneously rotating the liquid metal in the mould in the same direction as said tangential component by directing the electromagnetic field into the liquid metal below said meniscus without directing any substantial electromagnetic field into the metal of the meniscus or the skin forming at the top of the mould to thereby improve wetting of the surface of the mould by the liquid metal at the region of the meniscus.



8. Apparatus for continuous casting comprising, in combination, a continuous casting circular mould having refractory walls defining an inner surface, and a generally vertical axis, supply means for supplying the mould with liquid metal in a stream directed tangentially of the mould and inwardly of the inner surface of the mould and into a meniscus of molten metal at an upper portion of the mould, said supply means maintaining said meniscus at a predetermined level in said upper portion of the mould, electromagnetic induction means for rotating the liquid metal in the mould below said meniscus in the same direction as said tangentially directed stream, said electromagnetic induction means comprising electromagnetic windings spaced below said upper portion of the mould by a distance sufficient to substantially prevent the formation of electromagnetic fields in the upper portion of the mould containing the meniscus of liquid metal to thereby improve wetting of the surface of the mould by the liquid metal at the region of the meniscus, and mould coolimg means for cooling said mould.

4,137,962

APPARATUS FOR MARKING A MOLD SURFACE

Kenneth J. Pol, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 1, 1977, Ser. No. 812,185
Int. Cl.[2] B22C *7/00*; B41B *11/52*; B44B *5/00*
U.S. Cl. 164—236 **5 Claims**

2. An apparatus adapted to be incorporated in a foundry pattern of the type employed to sequentially form a series of foundry molds for metal castings, said apparatus being adapted to form a marking in said molds and comprising

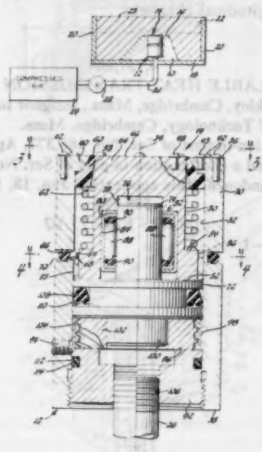
a housing defining a generally cylindrical hollow having a cylindrical axis,

a generally cylindrical marking body coaxially mounted in said hollow, said body having a mold-forming end bearing a marker and lying substantially perpendicular to said axis, said marking body being rotatable about said axis to alter the position of said marker and movable along said axis between a normal position for mold-forming and marking and a marking-changing position,

a generally cylindrical piston coaxially mounted within said hollow and rotatable about said axis, said piston being responsive to intermittent fluid pressure to move along said axis from a normal position to a marking-changing position and to cause said marking body to move from its normal position to its marking-changing position,

resilient means within the hollow and adapted to be acted upon by said piston and marking body when moving in response to fluid pressure, and to return said marking body and piston along said axis to their respective normal positions after fluid pressure is discontinued,

gear means engaging the piston and adapted to rotate said piston a predetermined angle about said axis as said piston moves along said axis,



clutch means intermediate said piston and said marking body and adapted to permit the piston rotating in one direction to engage and rotate said marking body to thereby alter said marker position, said clutch means permitting independent piston rotation in the opposite direction and

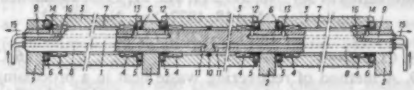
detent means carried by said housing and adapted to secure said marking body from rotation when in its normal position but permit said body to rotate when said clutch is engaged.

4,137,963

STRAND GUIDING ROLLER TO BE USED IN A CONTINUOUS CASTING PLANT

Konrad Langer, Linz, and Kurt Feix, Steyr-Gleink, both of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Sep. 12, 1977, Ser. No. 832,162
Claims priority, application Austria, Oct. 13, 1976, 7600/76
Int. Cl.[2] B22D *11/00*
U.S. Cl. 164—448 **7 Claims**



1. In a strand guiding roller to be used in a continuous casting plant and of the type including

a stationary axle,

at least three roller bodies journaled on said axle and each provided with an interior annular recess,

bearings for supporting the roller bodies accommodated in each annular recess,

at least two longitudinal channels provided in said stationary axle,

radial channels originating from said longitudinal channels

and extending to said annular recess provided in each roller body, thus forming a medium circuit, the improvement which is characterized in that at least two neighbouring roller bodies are always connected to one medium circuit, one of the longitudinal channels provided in said axle serving for supplying the medium to the roller body arranged closest to the middle of the roller and subjected to the greatest thermal wear during operation, and said medium flowing back in a meander-like manner through said radial channels, said annular recesses provided in the roller bodies, and sections of another one of said longitudinal channels.

4,137,964

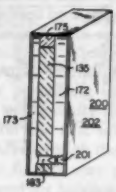
CONTROLLABLE HEAT TRANSMISSION APPARATUS

Bruce S. Buckley, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 465,377, Apr. 29, 1974, abandoned, and a continuation-in-part of Ser. No. 494,658, Aug. 9, 1974, abandoned. This application Jun. 18, 1975, Ser. No. 588,093

Int. Cl.[2] F28F *23/02*

U.S. Cl. 165—1 **62 Claims**



1. A method of controlling energy transmission between two close-spaced regions in a system, that comprises: confining a fluid in the space between the two regions; effecting natural convection flow of the fluid in one state in said space; and changing the rate of flow from that produced by said natural convection flow of the fluid in said one state, on the basis of a temperature parameter in the system, using only thermal energy directly transmitted to produce an effect internally of said space to thereby control the direction and/or the rate of fluid flow in said space by a mechanism other than the character of the fluid itself, said fluid, mostly by virtue of the convective properties of the fluid and without change from said one state thereof, acting to modulate the energy transmission between the two closely spaced regions of the system.

4,137,965

WASTE HEAT RECOVERY SYSTEM

John J. Fallon, Jr., 1330 Sugarloaf Dr., Pasadena, Calif. 91103, and Robert P. Cabeen, III, Glendale, Calif., assignors to John J. Fallon, Jr., Pasadena and Donald Ritt, Sun Valley, both of, Calif.

Continuation of Ser. No. 597,511, Jul. 21, 1975, abandoned. This application May 18, 1977, Ser. No. 798,122

Int. Cl.[2] F28D *15/00*

U.S. Cl. 165—1 **16 Claims**

9. A method of recovering waste heat in a processing system, the latter having of an exhaust stack through which exhaust gases are discharged, and heating a recipient fluid at a point remote from said exhaust stack, the method comprising the steps of:

(a) disposing a first heat exchanger within said exhaust stack such that said exhaust gasses will flow across its surfaces;

(b) disposing a second heat exchanger at said point remote from said exhaust stack such that said recipient fluid will flow across its surfaces;

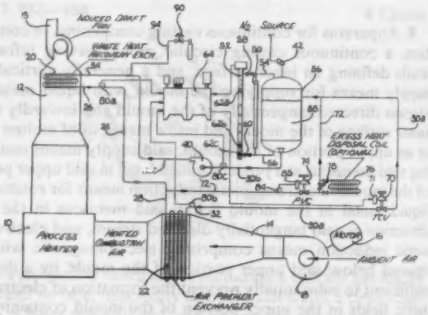
(c) coupling the inlet of said second heat exchanger in communication with the outlet of said first heat exchanger, and the outlet of said second heat exchanger in communication with the inlet of said first heat exchanger through conduit means, so as to define a closed circuit;

(d) providing a reservoir for storing heat transfer fluid in communication with said closed flow circuit;

(e) providing means for forcing heat transfer fluid to circulate through said closed flow circuit, said forcing means being disposed serially within said closed flow circuit;

(f) providing a heat transfer fluid in said closed flow circuit and said reservoir;

(g) controlling the temperature of said heat transfer fluid at least two critical points within said closed flow circuit by (i) sensing at least two temperatures, each at a point at which the temperature of said heat transfer fluid is critical; (ii) monitoring the temperatures sensed to detect an out-of-balance condition due to a change in the desired temperature of said fluid at any of said critical points and to provide a control signal in response thereto; and (iii) controlling a solenoid operated temperature control valve disposed serially in said closed flow circuit with said control signal so that the position of said valve determines the rate of flow of said heat transfer fluid therein;



(h) controlling the pressure of said fluid by: (i) providing a by-pass flow circuit comprising conduit means between the inlet of said second heat exchanger and said reservoir; (ii) providing a solenoid-operated pressure control valve serially in said by-pass flow circuit, the position of said valve determining the rate of flow of said heat transfer fluid therein; (iii) providing a pressure transducer at a point within said by-pass flow circuit, and (iv) controlling said solenoid operated pressure control valve by the output of said pressure transducer;

whereby, said heat transfer fluid will absorb waste heat from said exhaust gases as they pass through said first heat exchanger and release said recovered waste heat to said recipient fluid as it passes through said second heat exchanger, with the temperatures of said fluid at said critical points being maintained substantially within their desired ranges by said temperature controller and temperature valve adjusting the rate of flow of said fluid; and said temperature control valve adjusting the rate of flow of said fluid; and with the pressure of said fluid being maintained substantially within its desired range by said pressure transducer and pressure control valve adjusting the rate of flow of said fluid through said by-pass flow circuit.

4,137,966

SIMULATION OVEN

Richard D. Ulrich, Provo, Utah; Crill Maples, and Howard C. Schafer, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1977, Ser. No. 788,725
Int. Cl.[2] F25B *29/00*; F24C *15/24*; F27B *3/20*
U.S. Cl. 165—30 5 Claims

1. An oven for creating thermal gradients comprising:

a plurality of heating sections joined together forming an enclosure;

a plurality of temperature monitors distributed with at least one of said temperature monitors in each of said heating sections and mounted so as to measure the heat level therein;

a plurality of heating-cooling systems with at least one attached to each heating section so as to control the temperature therein and which is itself controlled by the temperature monitor for that heating section and where said heating-cooling systems contain a working fluid of oil which is suitable for causing radiation heating from said heating sections and is temperature controlled by a closed-loop feed back system; and

at least one blower positioned for inducing convection air flows over items placed in the oven.

4,137,967

STEAM GENERATOR

Georg Hirschle, Winterthur, Switzerland, assignor to SGX Sulzer-General Atomic Warmetauscher Aktiengesellschaft, Winterthur, Switzerland

Filed Oct. 14, 1976, Ser. No. 732,351
Claims priority, application Switzerland, Sep. 1, 1976, 11055/76
Int. Cl.[2] F28F *5/00*
U.S. Cl. 165—162 4 Claims

1. In a steam generator, the combination comprising

a mounting system,

a heat exchanger incuding a multiplicity of tubes suspended in said mounting system,

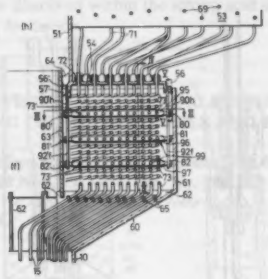
an anchoring system,

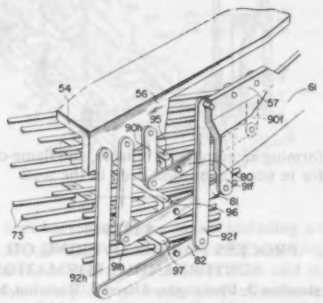
a plurality of supply lines mounted in said anchoring system for supplying a working medium to said tubes,

a plurality of discharge lines mounted in said anchoring system for discharging the working medium from said tubes,

a plurality of expansion pipe loops connecting said tubes to at least one of said supply lines and said discharge lines, and

means supporting said pipe loops in suspended manner, said means including at least one double-armed lever movably secured at each respective end to a respective one of said mounting system and said anchoring system and having a fulcrum supporting a point of at least one pipe loop, said point being located on said pipe loop and said fulcrum being located on said lever whereby the maximum stresses on said pipe loop on both sides of said point are approximately equal and as low as possible independently of the





state of expansion of said mounting system and said anchoring system to each other.

4,137,968

IGNITION SYSTEM FOR AN AUTOMATIC BURNER FOR IN SITU COMBUSTION FOR ENHANCED THERMAL RECOVERY OF HYDROCARBONS FROM A WELL

Curtis E. Howard, Humble; Douglas G. Calvin, and Robert W. Pitts, Jr., both of Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 669,127, Mar. 22, 1976, Pat. No. 4,079,784. This application Sep. 28, 1977, Ser. No. 837,052
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—53 9 Claims

1. A downhole burner for an in situ combustion operation in a well in a subterranean reservoir for recovering petroleum from the well comprising,

(a) air-fuel combustion chamber means positionable in the well at the depth of the desired in situ combustion in the subterranean reservoir for receiving fuel from a fuel supply conduit means, and for receiving air from an annular air supply means around said fuel supply conduit means for accumulating an air-fuel mixture therein said combustion chamber means,

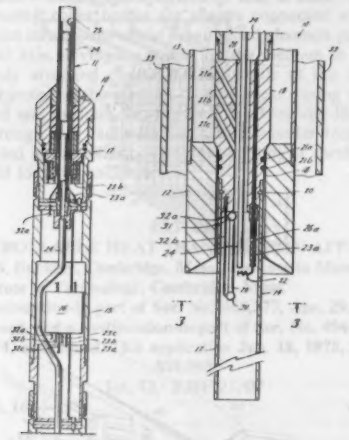
(b) ignitor means in said combustion chamber means for igniting said air-fuel mixture,

(c) thermocouple means in said combustion chamber means for detecting whether said air-fuel combustion chamber means is ignited or not ignited,

(d) electrical conduit means being mounted on the walls of both said fuel supply conduit means and said annular air supply means for energizing said thermocouple means and said ignitor means, and

(e) said ignitor means being responsive to said thermocouple means for being energized for igniting said air-fuel mixture in said combustion chamber means when no combustion is

occurring and for being de-energized when combustion is occurring in said air-fuel combustion chamber means for



forming an automatic, reliable, and flame-out proof burner for in situ combustion deep in the well.

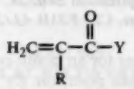
4,137,969

PROCESS FOR RECOVERING OIL FROM SUBTERRANEAN FORMATIONS

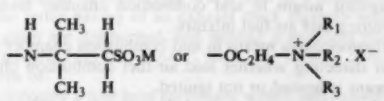
Charalambos J. Phalangas; Alfred J. Restaino, both of Wilmington, Del., and HanBo Yun, Trenton, N.J., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 446,071, Feb. 26, 1974, Pat. No. 4,024,040. This application Jan. 21, 1977, Ser. No. 761,041
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—274 **21 Claims**

1. A process for recovering hydrocarbon from a subterranean formation having an injection means in fluid communication with a production means comprising injecting into the formation an aqueous slug comprised of a water-soluvble, substantially linear, high molecular weight polymer obtained by a process which comprises irradiating an aqueous solution having a pH of about 2 to about 12 and containing about 10% to about 40% by weight of: (a) an ethylenically unsaturated monomer having the formula (I):



(b) mixtures of monomers of formula (I), or (c) mixtures of at least one of the monomers of formula (I) with up to 50% by weight of an ethylenically unsaturated monomer selected from the group consisting of vinyl sulfonic acid, alkali metal salts of vinyl sulfonic acid, diacetone acrylamide, and mixtures thereof, wherein R represents hydrogen or methyl and Y represents $-NH_2$, —OM,



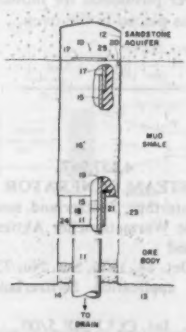
wherein M is hydrogen, H_4N^+, alkali metal, or any other cation yielding a water-soluble, polymerizable compound, R_1, R_2, and R_3 are 1 to 4 carbon alkyl radicals and X is an anion, and containing at least about 3% by weight of a salt selected from the group consisting of potassium sulfate, potassium chloride, potassium fluoride, potassium bisulfate, tribasic potassium phosphate, dibasic potassium phosphate, monobasic potassium phosphate, sodium sulfate, sodium bisulfate, sodium chloride, tribasic sodium phosphate, dibasic sodium phosphate, monobasic sodium phosphate, lithium sulfate, lithium bisulfate, lithium chloride, ammonium sulfate, ammonium bisulfate, ammonium chloride, tribasic ammonium phosphate, dibasic ammonium phosphate, monobasic ammonium phosphate, ammonium fluoride, aluminum sulfate, aluminum chloride, and mixtures thereof, with high-energy ionizing radiation at an intensity of about 1,000 to about 200,000 rads per hour to a total radiation dose of about 1,000 to about 30,000 rads, to form an aqueous solution of a water-soluble, substantially linear high molecular weight polymer, provided that when the aqueous solution contains at least 3% by weight of a water-soluble salt selected from the group consisting of aluminum sulfate, aluminum chloride, and mixtures thereof, the unsaturated monomer consists of about 5% to about 100% of cationic monomer and about 95% to 0% nonionic monomer, and the aqueous solution has a pH of about 2 to about 5, and provided that the aqueous solution has a pH of about 7 to about 9 when the water-soluble salt is an ammonium salt, and thereafter displacing the aqueous slug toward the production well to recover hydrocarbon therethrough.

4,137,970

PACKER WITH CHEMICALLY ACTIVATED SEALING MEMBER AND METHOD OF USE THEREOF

George P. Laflin, Denver, and Clarence J. Durborow, Englewood, both of Colo., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 20, 1977, Ser. No. 789,055
Int. Cl.[2] E21B *33/12*; E21F *16/00*
U.S. Cl. 166—292 **11 Claims**



4. In a tool for restricting the flow of fluid through an annulus defined by the interior walls of a fluid conduit and the exterior of a tubular member within said fluid conduit, said tool being of the type having an elongated mandrel and radially surrounding at least a portion of the length of the mandrel, at least one unitary deformable packer element for sealably engaging the walls of said fluid conduit to prevent the flow of a fluid through said annulus, the improvement which comprises: as the deformable packer element, a chemically expandable packer element which expands upon contact with said fluid; and means for restraining longitudinal expansion of said packer element, to thereby promote radial expansion of said element.

6. A method for restricting the flow of fluid through an annulus defined by the interior walls of a fluid conduit and the exterior of a tubular member within said fluid conduit, comprising (1) providing a tool of the type having an elongated tubular mandrel of a material substantially unreactive with said fluid, and radially surrounding at least a portion of the length of the mandrel, at least one unitary deformable packer element for sealably engaging the walls of said fluid conduit, wherein said packer element is a chemically expandable packer element

which expands upon contact with said fluid, and means for mechanically deforming said packer element; (2) positioning said packer tool withhin said fluid conduit so that the longitudinal axis of said packer is in substantial alignment with the longitudinal axis of said fluid conduit; (3) mechanically deforming the packer element to cause said element to engage the walls of said fluid conduit; and (4) thereafter contacting said packer element with said fluid, thereby further expanding said packer into more tight engagement with the walls of said fluid conduit.

4,137,971

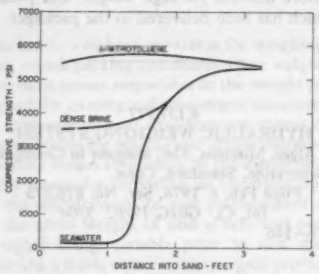
METHOD OF CONSOLIDATING A SUBTERRANEAN FORMATION

Christopher M. Shaughnessy, and William M. Salathiel, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 814,009, Jul. 8, 1977, abandoned. This application Feb. 17, 1978, Ser. No. 878,631

Int. Cl.[2] E21B *21/00, 43/00*

U.S. Cl. 166—295 **16 Claims**



1. A method of consolidating an incompetent subterranean formation surrounding a cased wellbore wherein the casing has an intermediate perforated interval opposite said formation which comprises;

(a) pumping a nonaqueous fluid down said wellbore to displace substantially all of the fluid in said casing below said perforated interval and to force the displaced well fluid into said formation, said nonaqueous fluid having a density greater than said well fluid;

(b) pumping a preflush solution having a density less than said nonaqueous fluid down said wellbore and into said formation;

(c) pumping a resinous material having a density less than said nonaqueous fluid down said wellbore and into said formation; and

(d) allowing said resinous material to harden thereby consolidating a portion of said formation.

4,137,972

ACIDIZING RESERVOIRS WHILE CHELATING IRON WITH SULFOSALICYLIC ACID

William A. McLaughlin, and David C. Berkshire, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 24, 1977, Ser. No. 809,586

Int. Cl.[2] E21B *43/16*

U.S. Cl. 166—307 **15 Claims**

1. In a well treating process in which an aqueous solution of a strong acid which contains from about 1 to 30% by weight of hydrochloric acid and is capable of dissolving solids in a manner increasing the permeability of a subterranean earth formation is contacted by ferric or ferrous iron compounds or metal within iron containers or conduits and is injected into a subterranean reservoir that contains an asphaltenic oil which tends to produce permeability impairing iron-asphaltene solids within the reservoir, the improvement which comprises, including within at least the first injected portion of the aqueous acid, a solution or homogeneous dispersion of at least enough 5-sulfosalicylic acid to chelate with and thereby prevent the formation of iron-asphaltene solids by substantially all of the ferric ions that become dissolved within the strong acid solution that enters the earth formation.

4,137,973

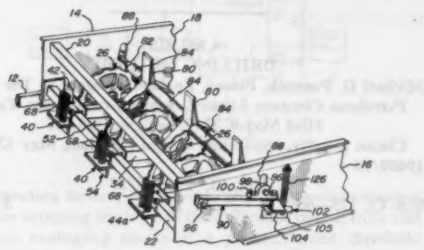
BEET HARVESTER WITH SPRING SYSTEM FOR PROTECTING ITS LIFTER WHEELS AND PADDLE SHAFT

Wayne J. Schwitters, Rte. #1, Box 19, Clara City, Minn. 56222

Filed Nov. 19, 1976, Ser. No. 743,175

Int. Cl.[2] A01D *19/00*

U.S. Cl. 171—58 **18 Claims**



1. In a sugar beet harvester, frame means including a transverse beam, an elongated strut, means pivotally attaching one end of said strut to said transverse beam so that said strut is angularly movable in a plane generally perpendicular to said beam, a pair of lifter wheels rotatably carried at the other end of said strut, and means connected to said strut and said beam for resiliently biasing said strut in a direction to cause its said other end, together with said lifter wheels, to move toward the ground during the digging of sugar beets.

4,137,974

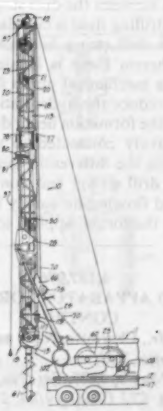
HYDRAULICALLY DRIVEN KELLY CROWD

Raymond E. Decker, Riverside, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jan. 6, 1977, Ser. No. 757,219

Int. Cl.[2] B23Q *5/027*

U.S. Cl. 173—147 **13 Claims**



1. In a vertical drilling rig, a kelly crowd mechanism comprising in combination:

a drive kelly;

a crowd drum having a cable thereon which is drivingly

coupled to crowd down said drive kelly when taken up on said drum;

a hydraulic motor;

a normally disengaged clutch operable to couple said motor to said drum in response to pressurized fluid;

a pressure regulated source of fluid;

a motor control valve manually operable to gate pressurized fluid supplied by said source to rotate said hydraulic motor and simultaneously engage said clutch to thereby rotate said crowd drum and thereby crowd down said drive kelly; and

a clutch control valve manually operable to gate pressurized fluid supplied by said source to engage said clutch and apply a brake to said crowd drum when said motor control valve is closed.

4,137,975

DRILLING METHOD

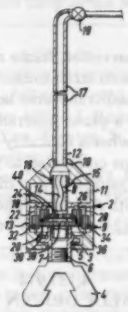
Michael D. Pennock, Pinner, England, assignor to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed May 9, 1977, Ser. No. 795,226

Claims priority, application United Kingdom, May 13, 1976, 19690/76

Int. Cl.[2] E21B *3/12*

U.S. Cl. 175—65 **3 Claims**



1. A method of drilling a hole in a formation which method comprises employing a drill bit connected to a drill string and rotating the drill bit by means of the drill string to drill the hole and form an annulus between the drill string and the wall of the hole and wherein a drilling fluid is circulated down the annulus and up through the drill string herein referred to a reverse circulation, and wherein there is located in the drill string above the drill bit a mechanical pump for upwardly moving the drilling fluid to reduce the hydrostatic pressure exerted by the drilling fluid on the formation being drilled, the drill bit and pump being operatively connected to a differential gearing located therebetween, the differential gearing being driven by the rotation of the drill string, and controllably varying the flow of drilling fluid flowing upwardly in the drill string and thereby controlling the torque applied to the pump and bit.

4,137,976

METHOD AND APPARATUS FOR BALE WEIGHT CONTROL

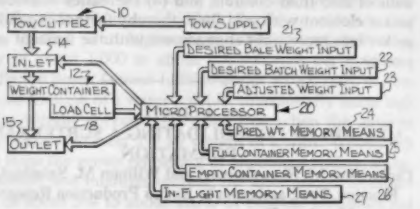
Allen M. Grayson, Jr., Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed May 9, 1977, Ser. No. 795,045

Int. Cl.[2] G01G *19/04, 19/52*

U.S. Cl. 177—1 **25 Claims**

1. A process for forming more uniform weight packages of fibrous material comprising supplying a continuing flow of fibrous material, successsively accumulating said material into batches having weights which are subject to variance from batch to batch, each batch having a weight which is a fractional portion of a desired package weight, successively releasing the batches of material to a packager, determining the actual weight of each batch delivered to the packager and registering such actual weight while totaling the registered actual weights of the successive batches, adjusting the weight



of at least certain batches in the succession based upon the registered actual weights to compensate for any variance in batch weights and thereby more closely control the total weight of material delivered to the packager and facilitate achieving more uniform package weight, and packaging the material which has been delivered to the packager.

4,137,977

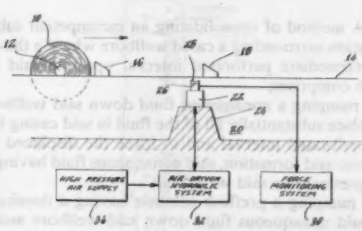
HYDRAULIC WEIGHING SYSTEM

Richard N. Alger, Moulton, Ala., assignor to Champion International Corporation, Stamford, Conn.

Filed Feb. 6, 1978, Ser. No. 875,373

Int. Cl.[2] G01G *19/02, 5/04*

U.S. Cl. 177—146 **15 Claims**



1. For use in weighing objects, a hydraulic weighing station comprising:

at least one hydraulic cylinder having a hydraulic piston which may be extended to support an object being weighed;

at least one fluid reserve tank having a fluid connection to one fluid inlet in each said hydraulic cylinder;

an air-hydraulic booster having a hydraulic fluid line communicating with a second fluid inlet to each of said cylinders, a first air line through which high pressure air may be applied to increase the pressure in said hydraulic fluid line, and a second air line through which high pressure air may be applied to relieve the pressure in said hydraulic fluid line;

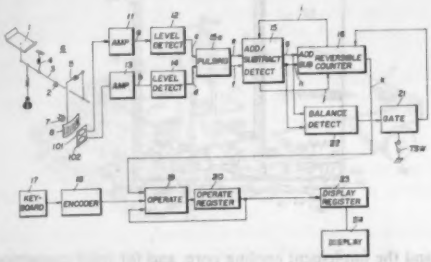
valve means connected to each said fluid reserve tank, to said first air line and to said second air line, said valve means being adapted to direct high pressure air through said first air line when each of said pistons is to be extended to support an object being weighed or to said second air line when each of said pistons is to be retracted to a non-supporting position; and

means for monitoring the force exerted on each of said pistons by the object supported by said pistons when in their extended position.

4,137,978
ELECTRONIC WEIGHING APPARATUS

Noboru Uyama, Osaka, and Tsutomu Ozaki, Amagasaki, both of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Apr. 22, 1977, Ser. No. 789,955
Claims priority, application Japan, May 1, 1976, 51-50208
Int. Cl.[2] G01G *13/14*
U.S. Cl. 177—165 18 Claims



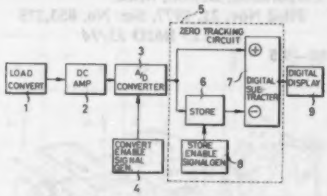
1. An electronic weighing apparatus for weighing an article in a packing, which packing constitutes a tare weight, comprising: displacement means responsive to the weight of an article being weighed for causing a displacement associated with the weight of said article, said displacement means comprising article support means for placing said article thereon, electrical signal providing means responsive to the displacement of said displacement means for providing an electrical signal associated with the displacement of said displacement means and thus with the gross weight of said article and packing, said electrical signal being variable prior to said displacement means achieving a stable state, enabling signal providing means operatively coupled to said electrical signal providing means and responsive to said electrical signal becoming steady for providing an enabling signal within a predetermined delay period of time following the point of time when said electrical signal became steady, tare weight deduction instructing means for instructing the deduction of said tare weight from the gross weight of said article and said packing, said tare weight deduction instructing means being enabled only when a tare weight is placed on said article support means, an article without the packing being further placed on said article support means after said tare weight deduction instructing means is enabled, and tare weight deducting means responsive simultaneously to the enabling signal output from said enabling signal providing means and to the output from said tare weight deduction instructing means for deducting said tare weight from the gross weight of said article and said packing for providing a net weight of said article.

4,137,979
ELECTRONIC WEIGHING APPARATUS

Seiichi Itani, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Aug. 10, 1977, Ser. No. 823,289
Claims priority, application Japan, Aug. 25, 1976, 51-101929
Int. Cl.[2] G01G *3/14*
U.S. Cl. 177—210 R 18 Claims

1. An electronic weighing apparatus comprising; means responsive to a load being weighed for generating an electrical analog signal representative of the load, analog-digital converting means responsive to said electrical analog signal generating means for converting said electrical analog signal into an electrical digital signal representative of the load; memory means operatively coupled to said analog-digital converting means and responsive to a store enable signal for storing the electrical digital signal from said analog-digital converting means in said memory means, difference evaluating means responsive to said analog-digital converting means and to said memory means for providing a difference output by evaluating the difference between the electrical digital signal output from said analog-digital converting means and the electrical digital signal output from said memory means, digital display means operatively coupled to said difference evaluating means for displaying the output from said difference evaluating means in a digital manner, means connected to said memory means for providing a store enable signal to said memory means, said store enable signal providing means comprising means responsive to said difference evaluating means for detecting a zero state of said difference output from said difference evaluating means thereby providing a zero detected output, threshold

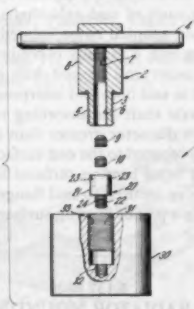


value detecting means responsive to said difference evaluating means for detecting the level of the difference output from said difference evaluating means at a predetermined threshold value thereby providing a detected threshold value output, timing means operatively coupled to said zero detecting means and to said threshold value detecting means, said timing means being responsive to at least one of said zero detected output and said threshold value detected output whereby the timing means are triggered to perform a timing operation for a predetermined time duration, and further means responsive to said timing means for providing a store enable signal to said memory means for a time period other than said predetermined time duration.

4,137,980
FAIL-SAFE MEASURING WEIGHT

Harry C. Becker, 190 Broadview Ave., New Rochelle, N.Y. 10804

Filed Sep. 12, 1977, Ser. No. 832,271
Int. Cl.[2] G01G *1/18*
U.S. Cl. 177—264 6 Claims



1. A weight measuring instrument comprising:
a body portion having a threaded bore therethrough, said threaded bore including a portion of reduced diameter;
an adjustment plug, having a head portion and a stem portion, said stem portion being exteriorly threaded and receivable in the portion of reduced diameter in the threaded bore of said body portion, said head portion including means for screwing the stem portion of said

adjustment plug into the portion of reduced diameter of the bore of the body portion;

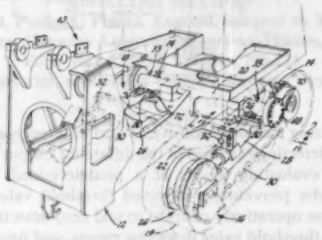
a cover member having an exteriorly threaded stem portion receivable in the threaded bore of the body portion, said cover member including a threaded bore for receiving adjustment particles, said cover member further including means for sealing said adjustment particles within said cover member bore.

4,137,981

PIVOT SHAFT ROLLER FRAME SUPPORT

Francis J. Halterman, Jr., Ravenna, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1977, Ser. No. 853,275
Int. Cl.[2] B62D *55/14*
U.S. Cl. 180—9.5 **3 Claims**



1. In a crawler tractor vehicle having a main frame provided with a pair of laterally spaced track frames disposed on opposite sides of said main frame, a transversely extending pivot shaft rigidly connected to said main frame and having the opposite ends thereof provided with axle shafts each of which is formed with a cylindrical outer surface and an end surface, support means connecting the rear end of each of said track frames to said pivot shaft for vertical swinging movement relative to said main frame, a transversely extending equalizer bar pivotally connected to the forward end of said main frame on a longitudinal axis and having the opposite ends operatively associated with the front ends of said track frames for maintaining the latter in spaced relation during pivotal movement about said pivot shaft, the improvement wherein said support means comprises a hub member secured to the associated track frame and having a bore formed therein defined by a cylindrical inner wall for receiving each of said axle shafts, said hub member having an inner end adapted to be located adjacent the main frame and an outer end, a radially extending flange integrally formed with the outer end of said hub member, a bearing assembly mounted in said bore and interposed between the hub member and the axle shaft for absorbing radial loads, a disk-type plate having a diameter greater than the diameter of the axle shaft centrally secured to the end surface and having a pair of laterally spaced outer bearing surfaces for absorbing thrust loads, and an end cap secured to said flange and together with the latter providing a pair of bearing surfaces for engaging said disk-type plate.

4,137,982

REINFORCED RADIATOR MOUNTING FOR HEAVY VEHICLES

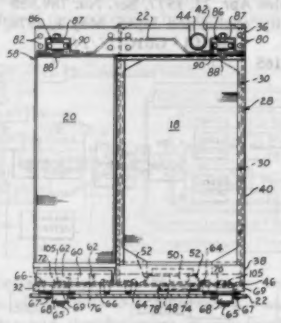
Donald R. Crews, Peoria; Billy J. Davis, East Peoria; Roger E. Treick, Peoria, and John C. Wellauer, Dunlap, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 8, 1977, Ser. No. 822,850
Int. Cl.[2] B60K *11/04*
U.S. Cl. 180—68 R **5 Claims**

1. Apparatus for mounting an engine fluid cooling core and an implement fluid cooling core on a vehicle frame, comprising:

receptacle means for receiving and for releasably securing the engine cooling core therein;

means for selective connection to either of the receptacle



and the implement cooling core, and for joint connection to the receptacle and the implement core; and

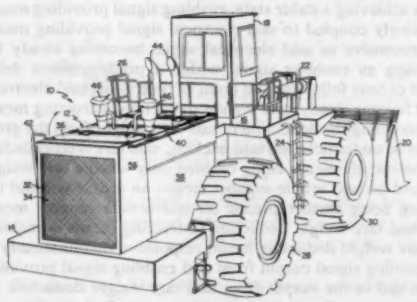
means for resiliently mounting the means for selective connection on the frame.

4,137,983

SECTIONALIZED PANEL CLOSURE

William E. Gray, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 11, 1977, Ser. No. 814,596
Int. Cl.[2] B62D *25/10, 27/06*
U.S. Cl. 180—69 R **18 Claims**



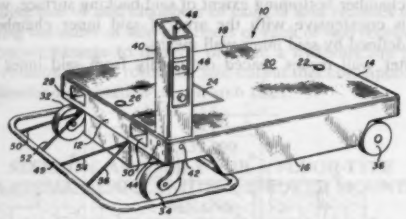
1. A closure for a top access opening into a compartment comprising a plurality of separate closure sections, mounting means superposedly positioning said sections over said access opening and in adjacent side by side relationship, said sections conjointly covering and closing said access opening, coactive means on contiguous edges of adjacent ones of said sections, said coactive means including a fulcrum pin adjacent an edge of a first said section and a cradle hook on an edge of an adjacent section, said edge adjacent said fulcrum pin having a recess therein, a curvilinear recess facing insert in said recess, said fulcrum pin being within said recess, said insert partly surrounding said fulcrum pin and being radially spaced therefrom, said cradle hook having an underside and including a downwardly opening hooked end thereon, said cradle hook, in a normal mounted position of said adjacent sections, extending over said fulcrum pin, with said hooked end opening toward and spaced from, and partly above, said fulcrum pin, said hooked end being operatively engageable with said fulcrum pin to rotatively pivot said adjacent section over said first said section and upon pivoting of said adjacent section, opening a section of said closure, and providing access into a part of said compartment therebelow.

4,137,984

SELF-GUIDED AUTOMATIC LOAD TRANSPORTER

Frederick R. Jennings, 7740 Obsidian Court, Cupertino, Calif. 95014, and James O. Moritz, 15830 Rica Vista, San Jose, Calif. 95127

Filed Nov. 3, 1977, Ser. No. 848,245
Int. Cl.[2] B62D *1/24*
U.S. Cl. 180—98 14 Claims



1. A self-guided automatic load transporter comprising: a generally rectangular vehicle body including

parallel front end and rear end walls and parallel left side and right side walls,

a plurality of transverse and longitudinal upright internal walls dividing said body into a plurality of portions,

base plate means closing the bottom of a number of said portions to form upwardly opening box-like compartments, at least three of the remaining unclosed body portions forming wheel wells,

a pair of parallel fork tubes extending through the body and open on at least one end to form means for receiving the forks of a forklift, and

a cargo plate forming the top surface of said body and serving to close the tops of said portions to thereby cover said compartments;

first and second castor wheels disposed within two of said wells for supporting one end of said body;

an elongated axletree having a first drive wheel attached to one end thereof and a second drive wheel attached to the other end thereof, said axletree being disposed in said third well and pivotally attached to and supporting the other end of the body;

first and second drive means carried by said axletree for powering said first and second driven wheels, respectively;

bumper means formed into a closed loop having a forward portion and a rearward portion, said bumper means being disposed around said castor wheels and beneath said body, with said forward portion partially extending forwardly and sidewardly of said front end wall;

suspension means for attaching said bumper means to said body; and

a bumper contact sensing means responsive to bumper displacement and operative to de-energize said drive means, thereby halting motion of the transporter.

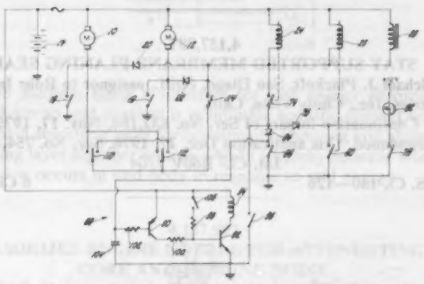
4,137,985

VEHICLE SECURITY SYSTEM

Frank J. Winchell, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1977, Ser. No. 854,530
Int. Cl.[2] B60R *24/02*
U.S. Cl. 180—114 6 Claims

6. A vehicle security system comprising electromechanical door latch means for releasably latching a vehicle door, electromechanical steering shaft lock means adapted when energized to permit steering shaft rotation, key actuable switch means actuable from the exterior of said vehicle for energizing said latch means to release said vehicle door and for energizing said steering shaft lock means to permit steering shaft rotation, a door jam switch actuable to a circuit closing position in response to door opening, a relay operable in response to actuation of said key actuable switch means and including relay contact means establishing, upon energization of said relay, an energizing circuit between said steering shaft lock means and said door jam switch means whereby said steering shaft lock means remains energized after the actuation of said key actuable switch means if said vehicle door is open, seat occupancy responsive switch means connected in series with said relay contact means and in parallel with said door jam switch for providing an energizing circuit for said steering shaft lock means independent of said door jam switch, whereby said steering shaft lock means remains energized after door closure if the vehicle seat is occupied, diode means elec-



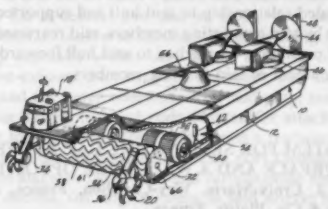
trically isolating said door latch means from said relay switch means, time delay means connected with said seat occupancy responsive switch means to prevent deenergization of said steering column lock means unless said seat occupancy responsive switch has been deactuated for a predetermined interval of time, operator actuable switch means actuable from the interior of said vehicle and connected in parallel with said diode means and operable when actuated to establish an energizing circuit for said door latch means through said relay switch means and said seat occupancy responsive switch means, vehicle speed responsive switch means connected in series with said operator actuable switch means to prevent energization of said door latch means when the vehicle is above a predetermined speed.

4,137,986

CAPTURED AIR BUBBLE ARCTIC VEHICLE WITH ICE CUTTERS

Joseph F. Schirtzinger, Pasadena, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Filed Jun. 17, 1977, Ser. No. 807,487
Int. Cl.[2] B60V *1/04, 3/04*
U.S. Cl. 180—119 21 Claims



1. A vehicle for the transport of cargo over the ice, and frozen or other ground surfaces, comprising:

(a) a cargo carrying hull including a source of power for the vehicle and means to control operation of the vehicle;

(b) at least one pair of spaced longitudinal runners beneath the undersurface of the hull and running lengthwise of the cargo carrying hull;

(c) first ice cutting means positioned forward of each runner

adapted to cut a track in the surface of ice and frozen ground of a width and depth at least sufficient to engage the runner to provide a running surface and prevent lateral movement of the vehicle by the action of crosswinds;

(d) fore and aft transverse seal means positioned between said runners, said seal means adapted to form sealing contact between the undersurface of the hull and the ice and frozen ground surfaces to form in combination with the runners a plenum chamber;

(e) means to induce the flow of a gaseous medium into the plenum chamber to pressurize the plenum chamber and provide lift to the vehicle to minimize friction between the runners and the cut track and minimize friction during transit of the vehicle over the surface.

4,137,987

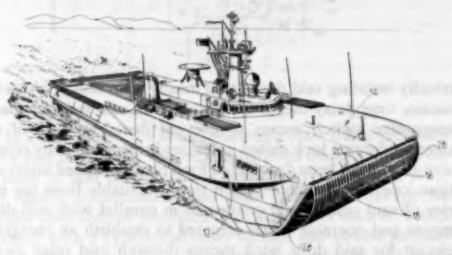
STAY SUPPORTED MEMBRANE PLANING SEAL

Michael J. Plackett, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Continuation-in-part of Ser. No. 632,184, Nov. 17, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,478

Int. Cl.[2] B60V *1/04*

U.S. Cl. 180—126 **6 Claims**



1. A planing seal for a vehicle, said vehicle comprising a hull having downward extending sidewalls for forming a plenum chamber therebetween comprising:

a plurality of juxtaposed elongated supporting members positioned parallel to and between said sidewalls, said supporting members have a stiff section intermediate forward and rearward flexible sections, the forward section being attached to said hull;

at least one forming member being attached between said hull and said stiff section thereby providing freedom of movement of the flexible sections; and

a flexible membrane extending the width of said hull between said sidewalls, said membrane having its forward and rearward surfaces spaced apart and fixedly attached in a sealed relationship to said hull and supported at least in part by said supporting members, said rearward surface of said membrane is attached to said hull forward of the hull attachment of said forming members.

4,137,988

SYSTEM FOR SEALING THE GAP BETWEEN A SURFACE AND A WALL EDGE OPPOSITE IT

Francis J. Croix-Marie, Viry-Chatillon, France, assignor to Bertin & Cie, Plaisir, France

Filed Jun. 20, 1977, Ser. No. 808,278

Claims priority, application France, Jun. 25, 1976, 76 19334

Int. Cl.[2] B60V *1/02*

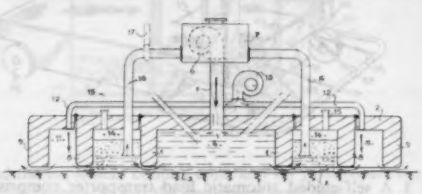
U.S. Cl. 180—130 **8 Claims**

1. A ground-effect apparatus having a solid frame designed to move above and proximate to a generally horizontal backing surface with the interposition of a pressure fluid cushion system lifting said solid frame out of physical contact engagement with said backing surface and in substantially frictionless, generally horizontal motion relationship with respect thereto, comprising:

inner wall means depending from said frame and projecting towards said backing surface to end short thereof, said inner wall means bounding laterally an inner chamber wide open towards said backing surface and bottomed thereby,

a compact mass of liquid contained in said inner chamber by said inner wall means, in outright wetting contact with the chamber bottoming extent of said backing surface, which is coextensive with the area of said inner chamber as defined by said inner wall means,

outer wall means spaced outwardly from said inner wall



means and likewise thereto depending from said frame and projecting towards said backing surface to end short thereof, said outer wall means bounding laterally an outer chamber around said inner chamber, wide open towards said backing surface and bottomed thereby,

means for feeding said outer chamber with gaseous fluid at a pressure in excess of the pressure obtaining in said inner chamber, thereby precluding leakage of liquid from said inner chamber into said outer chamber through the intervening peripheral gap between said backing surface and said inner wall means ending short thereof, and

means for circulating said liquid along a closed circuit which includes said inner chamber and a hydraulic loop outside the same.

4,137,989

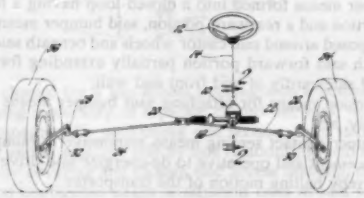
ROTARY HYDRAULIC SERVO FOR STEERING GEAR

Frederick L. J. Rehfeld, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 11, 1977, Ser. No. 840,919

Int. Cl.[2] B62D *5/10*

U.S. Cl. 180—148 **4 Claims**



4. A rotary hydraulic servo for a power steering gear comprising a stationary housing, a rotatable stub shaft extending axially into said housing, a stator having a cylindrical internal wall mounted in said housing concentric with said stub shaft, a rotatable output extending from said housing, a rotor rotatably mounted within said stator drivingly connected to said output, said rotor having a plurality of lobes circumferentially spaced from each other and extending radially outwardly therefrom into contact with the internal wall of said stator to provide a plurality of recesses therein, a plurality of vanes circumferentially spaced from each other in said stator, spring means for biasing said vanes into contact with the periphery of said rotor, said vanes being located at predetermined circumferential distances from each other to separate each of said recesses into first and second pressure chambers between adjacent lobes,

said housing having input passage means for conducting pressure fluid into said servo and output passage means for conducting discharge fluid from said servo, a valve element secured to said stub shaft for rotary movement therewith and operatively disposed between said stub shaft and said rotor, said valve element having a plurality of alternating input and discharge passages hydraulically connected with said rotor, and drive means connecting said stub shaft to said valve element so that rotation of said stub shaft and said valve element in either direction will connect a high pressure to a corresponding one of said chambers of each of said recesses while opening the other of said chambers of each of said recesses to the output passage to thereby produce a hydraulically powered rotation of said rotor and said output that corresponds to the direction of rotation of said stub shaft.

4,137,990

STEERING ASSEMBLY FOR A FLOOR-TYPE INDUSTRIAL VEHICLE WITH IMPROVED MOUNTING MEANS

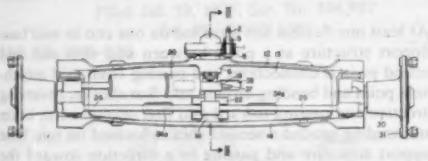
Theodor Abels, Aschaffenburg, Fed. Rep. of Germany, assignor to Linde AG, Wiesbaden, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,850

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642902

Int. Cl.[2] B62D *5/06*

U.S. Cl. 180—155 **8 Claims**



1. A steering-axle assembly for a floor-type industrial vehicle, especially a fork-lift truck, comprising:

an elongated axle body;

a pair of wheel-carrying axles pivotally connected to said body at the ends thereof;

a steering linkage on said body for displacing said axles angularly; and

mounting means for securing said body to a vehicle chassis, said mounting means comprising at least two ball joints mounted on said body and having centers defining an axis affording relative angular displacement of said body and said chassis, each of said ball joints including

a downwardly open ball socket adapted to be secured to said chassis,

a respective ball mounted upon said body and received in each of said sockets, and

a respective retaining plate engaging beneath said ball and holding same in the respective socket while suspending said axle body from said vehicle chassis.

4,137,991

CLAMPED ACOUSTIC ELASTIC WAVE GENERATOR

Robert L. Melcher, Yorktown Heights, and Robert J. von Gutfeld, New York, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1976, Ser. No. 744,354

Int. Cl.[2] G10K *10/00;* **G01N** *29/00*

U.S. Cl. 181—142 **17 Claims**

1. Transducer apparatus for generating acoustic waves in response to application of a source of energy thereto comprising:

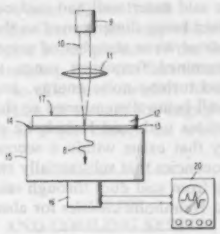
a body of a solid material adapted for acoustic vibration,

an energy absorbing layer composed of a thin film of solid opaque metallic material for absorbing energy,

a bonding agent located between said body and said absorbing layer for maintaining said body in intimate acoustic contact with said body of solid material,

a solid clamping medium,

said absorbing layer being disposed intermediate said body and said clamping medium, and



said medium being a substrate for said energy absorbing layer so said medium is in intimate acoustic contact with said absorbing layer for acoustically clamping said absorbing layer together with said body whereby acoustic vibration occurs in said body in response to said energy.

4,137,992

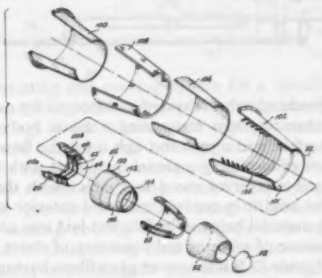
TURBOJET ENGINE NOZZLE FOR ATTENUATING CORE AND TURBINE NOISE

Gerald T. Herman, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Naples, Italy

Filed Dec. 30, 1976, Ser. No. 755,836

Int. Cl.[2] F01N *1/00*

U.S. Cl. 181—213 **14 Claims**



1. In a noise attenuating nozzle assembly for a turbojet propulsion engine having an annular, core-exhaust port and in which said nozzle assembly is of the type having an annularly-shaped sleeve that has an inner wall surface, and further having a plug that has a central axis and an outer wall surface of generally circular transverse section, said plug being mounted substantially coaxially within said sleeve so as to define an annular, core-exhaust duct between the inner wall surface of said sleeve and the outer wall surface of said plug, said sleeve and said plug having forward ends adapted for attachment to such engine so that said annular duct forms a rearward extension of the engine's annular core-exhaust port through which exhaust gases and associated core and turbine noise energy are rearwardly ducted, the improvement in said nozzle assembly comprising:

acoustical structure integrated into said plug and including an acoustical liner having a perforated, outer wall defining the outer wall surface of said plug, and having a perforated inner wall spaced equidistantly inwardly from said outer wall, and core means sandwiched between said outer and inner walls for transmitting noise energy therebetween in directions oriented radially of said central axis of said plug;

said inner wall bounding a generally hollow interior of said plug and said acoustical structure further including partitioning means disposed inside of said plug for dividing the interior of said plug bounded by said inner wall into a plurality of Helmholtz sound absorbing resonant cavities; and

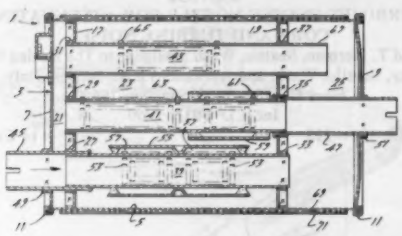
perforations in said outer wall and said core means of said acoustical liner being dimensioned so that said acoustical liner is a quarter wave absorber of noise energy within a first predetermined frequency range that substantially embraces said turbine noise energy, and perforations in said inner wall being dimensioned so that said acoustical liner cofunctions with said Helmholtz cavities to couple noise energy that exists within a second predetermined range of frequencies that substantially embraces said core noise energy from said duct through said acoustical liner and into said Helmholtz cavities for absorption thereby.

4,137,993

INSULATED EXHAUST SYSTEM COMPONENT

Paul A. Rutt, Jackson, Mich., assignor to Tenneco, Inc., Racine, Wis.

Filed Sep. 21, 1977, Ser. No. 835,054
Int. Cl.[2] F01N 7/16
U.S. Cl. 181—282 **6 Claims**



1. An insulated exhaust system component for a combustion engine exhaust system comprising a metal body having an exterior surface and a path through it for the flow of exhaust gas, a layer of insulating material in contact with the exterior surface, and a layer of metal in contact with the insulating material to hold it in contact with said exterior surface, said insulating material being a flexible wet-laid mat characterized by the absence of asbestos and consisting of about 95–98% by weight of grade D-E interwoven glass fibers having a diameter of about 5.08–7.62 microns and a fiber length of about ¼ to ½ inch with at least 80% of the fibers being at least ¼ inch long and a polyvinyl alcohol resin binder dispersed substantially uniformly throughout the mat and comprising about 2–5% of the weight of the mat, said mat having a basis weight in the range of about 65–150 pounds per 3000 square feet and a caliper in the range of about 0.020 to 0.100 inches, the mat having a tensile strength of at least about 2.5 pounds per inch of width.

4,137,994

CONSTANT LEVEL SCAFFOLD ADAPTED FOR USE WITH A TILT BED TRUCK

Donald Wood, R.R. 1, Sidney, Nebr. 69162

Filed Feb. 16, 1978, Ser. No. 878,258
Int. Cl.[2] E04G 1/18
U.S. Cl. 182—2 **7 Claims**

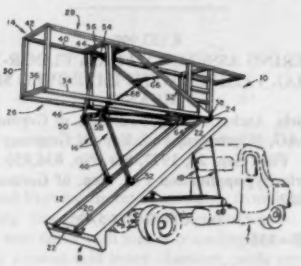
1. A constant-level scaffold adapted for use with a tilt bed truck comprising:

(a) A base support structure;

(b) Means for securely fastening said base support structure to the bed of a tilt bed truck;

(c) A scaffold platform pivotally connected by a first pivotal connection on one side to said base support structure, said first pivotal connection being adapted and arranged to be adjacent to the side of said truck bed which will rise as said truck bed is tilted;

(d) At least one centrally hinged compression member having a second pivotal connection to said base support structure and a third pivotal connection to said scaffold platform, said hinge of said compression member including a first sheave for the passage therethrough of a flexible line, said compression member positioned such that said central hinge is located in a direction from said second and third pivotal connections opposite from said first pivotal connection and adapted and arranged such that as said central hinge moves toward said first pivotal connection, the angle between said base support structure and said scaffold platform increases; and



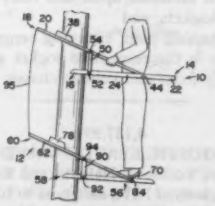
(e) At least one flexible line attached on one end to said base support structure at a point between said first and said second pivotal connections and passing from said attachment point and bending around said first sheave, reversing direction and passing toward said first pivotal connection and bending around a second sheave located on said base support structure and passing in a direction toward the chassis of said truck for attachment to said chassis, whereby as the truck bed is tilted, the portion of the line between the base support structure and said first sheave decreases and the portion of the line between said first sheave and said second sheave decreases causing the angle between said base support structure and said scaffold platform to increase.

4,137,995

POLE CLIMBING APPARATUS

Frank Fonte, 406 S. Habana, Tampa, Fla. 33609

Filed Dec. 2, 1977, Ser. No. 857,003
Int. Cl.[2] A47C 9/10; A63B 27/02
U.S. Cl. 182—135 **9 Claims**



1. A pole climbing apparatus for use in the installation and repair of telephone lines and the like comprising an upper work platform and a lower climbing platform, said upper work platform includes an upper base plate having a seat member held in fixed spaced relation relative to a first upper pole engaging element by a pair of substantially parallel side frame members to cooperatively form a leg opening therebetween and a second upper pole engaging element coupled to said upper base plate by an upper interconnecting element comprising a pair of substantially parallel upper interconnecting mem-

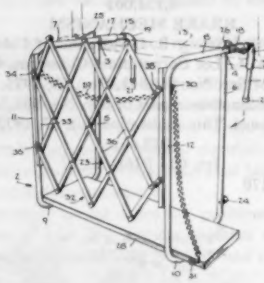
bers extending from opposite sides of said upper base plate to opposite sides of said second upper pole engaging element, said upper work platform further includes an upper safety lock comprising a resilent member coupled between said substantially parallel upper interconnecting members to secure said second upper pole engaging element against the pole when in use, said lower climbing platform includes a lower base plate having a foot support member formed thereon and a first lower pole engaging element formed on the inner portion of said lower base plate and a second lower pole engaging element coupled to said lower base plate by a lower interconnecting element comprising a pair of substantially parallel lower lower interconnecting members extending from opposite sides of said lower base plate to opposite sides of said second lower pole engaging element, said lower climbing platform further including feet engaging elements formed on said foot support member to secure the operator's feet thereto whereby the operator stands on said lower climbing platform raising said upper work platform with his arms to separate said upper work platform and lower climbing platform vertically relative to each other and then while seated on said upper work platform raises his feet lifting the lower climbing platform toward said upper work platform successively to adjust the elevation of said upper work platform relative to the pole.

4,137,996

PORTABLE SCAFFOLDING DEVICE

Robert N. Brown, 120 Poplar St., Greenfield, Mass. 01301

Filed Jul. 19, 1977, Ser. No. 816,957
Int. Cl.[2] E04G *3/06*
U.S. Cl. 182—150 **7 Claims**



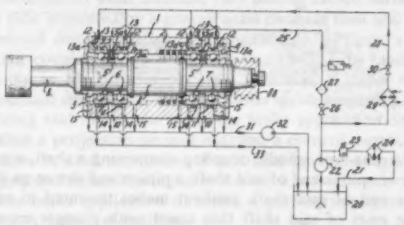
1. A portable and collapsible scaffolding device comprising:
a pair of spaced suspension units, each unit comprising a single piece of tubing bent to form a first vertical suspension member adapted to be adjacent the wall of a structure, a bottom cross member connected at one end and extending laterally from the lower end of said first suspension member, a second vertical suspension member spaced from said first member and extending upwardly from the opposite end of said bottom member, and a top rail member spaced from said bottom member and extending from the upper end of said second member toward the upper end of said first member and being secured thereto, whereby all of said units are below the top rails;
a platform pivotally secured to one of said units at the bottom member thereof and extending over the bottom member of the other of said units;
a collapsible gate extending between and interconnecting the second member of one of said units and the second member of the other of said units;
a pair of adjustable suspension arms having a horizontal portion and a downwardly extending portion, the horizontal portion of one of said arms being adjustably connected to, and forming an extension of, the top rail of one of said units and the horizontal portion of the other of said arms being adjustably connected to, and forming an extension of, the top rail of the other of said units to permit the downwardly extending portion of each arm to be adjusted in spacing with respect to the adjacent first vertical suspension member and thereby be adjusted to embrace sills of different widths;
means on said units for maintaining said arms in position after they have been adjusted; and
a projection on the first vertical suspension member of each of said units at a lower portion of the first member, said projection extending from the first member in the direction relative to said first member of the downwardly extending portion of an arm for engaging the wall of a structure below a sill thereof on which the device is mounted.

4,137,997

LUBRICATING AND COOLING SYSTEM FOR SPINDLE BEARING ASSEMBLY

Shigenori Ando, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Japan

Filed Aug. 12, 1977, Ser. No. 824,314
Claims priority, application Japan, Aug. 13, 1976, 51-108679[U]; Aug. 13, 1976, 51-108680[U]
Int. Cl.[2] F16N *17/02;* **F16C** *1/24*
U.S. Cl. 184—6.22 **10 Claims**



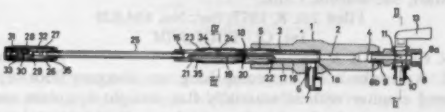
1. A lubricating and cooling system for a spindle bearing assembly comprising a closed spindle housing, axially spaced spindle bearings in said housing and a spindle rotatably supported by said bearings, said housing having separate admission ports for supplying lubricating oil and cooling fluid to said bearings, said system comprising means for supplying lubricating oil under pressure to said lubricating oil admission ports, means for cooling cooling fluid and supplying said cooled cooling fluid to said cooling fluid admission ports and means for individually controlling the rate at which said lubricating oil is supplied to said lubricating oil admission ports and the rate at which cooling fluid is supplied to said cooling fluid admission ports.

4,137,998

OIL CHANGE NOZZLE

Rokutaro Kusada, 7-9, 7-chome, Takadono, Asahi-ku, Osaka-shi, Osaka-fu, Japan

Filed Aug. 30, 1977, Ser. No. 829,097
Claims priority, application Japan, Sep. 9, 1976, 51-121856[U]
Int. Cl.[2] F16N *3/02;* **F01M** *11/04*
U.S. Cl. 184—14 **1 Claim**



1. An oil change nozzle comprising:
a body having a shouldered center hole to form a smaller diameter hole and a larger diameter hole,
a pipe having one end screwed in said larger diameter hole

in the body to form an annular passage between a smaller diameter end thereof and the inner wall of said larger diameter hole,

two inflatable tubes mounted on said pipe spaced from each other and having each end sealed so as to be oil-tight,

said pipe having first and second radial passages to inflate said two tubes with oil under pressure to seal the area between said two tubes,

a check valve provided in said pipe at the end thereof opposite the end in said body,

the interior of said pipe being longitudinally partitioned to form an oil supply passage and an oil drain passage,

said pipe having third and fourth radial passages communicating with said oil drain passage, said fourth radial passage communicating with said annular passage, and

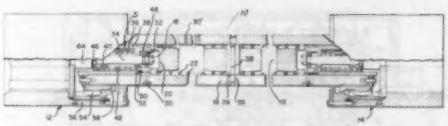
said body having an oil drain port communication with said annular passage.

4,137,999

SELF-LUBRICATING GEAR-TYPE SPINDLE COUPLING

Daniel H. Siegert, Pasadena, and Steven Banki, Baltimore, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 3, 1977, Ser. No. 821,347
Int. Cl.[2] F16N *11/04*
U.S. Cl. 184—45 R **3 Claims**



1. In a gear-type spindle coupling comprising a shaft, a roll and sleeve on one end of said shaft, a pinion and sleeve on the opposite end of said shaft, resilient means mounted in said opposite ends of said shaft that coact with plunger means which abut thrust plates adapted to be inserted in both of said sleeves, and flex hubs surrounding both ends of said shaft with carrying means drivingly connecting said sleeves to said shaft, the improvement therewith comprising:

(a) a plurality of first reservoir means in said shaft, said reservoir means adapted to receive a lubricating fluid for lubricating said sleeves and hubs;

(b) said first valve means operably connected to said first reservoir means, said first valve means adapted to be opened when said thrust plates are inserted in said sleeves, said first valve means permitting said lubricating fluid to enter second reservoir means formed by the retraction of said resilient means when said thrust plates are inserted in said sleeves; and

(c) second valve means operably connected to said second reservoir means, said second valve means adapted to permit said lubricating fluid to flow from said second reservoir through said second valve means toward said sleeve and hubs when said thrust plates are retracted from said sleeves.

4,138,000

CHECKOUT COUNTER

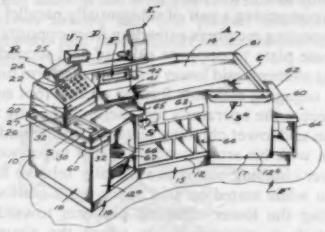
Frederick W. Hartup, Sacramento, Calif., assignor to Bel Air Mart, Sacramento, Calif.

Filed Jul. 8, 1977, Ser. No. 814,029
Int. Cl.[2] E04H *3/04*
U.S. Cl. 186—1 A **24 Claims**

1. A checkout system comprising: an elongate floor-supported counter with substantially flat, straight upstream and downstream ends, front and rear sides and a horizontal top surface, said upstream end and said downstream end being at the left side and right side respectively as viewed by a checker facing the center of the counter from the front side thereof;

cash register support means for supporting a cash register with a manually engageable keyboard atop the rear upstream corner portion of said top surface with said keyboard disposed toward the left end portion of said front side;

product support means including an item supporting panel in the counter with said panel coplanar with said surface adjacent said left end and spaced forward from a cash register supported by said cash register support means; and



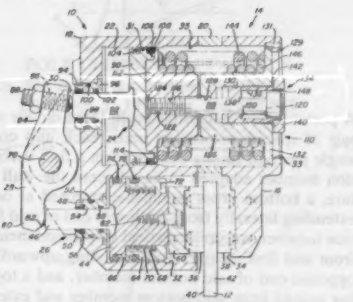
a conveyor means within the counter and having a normally downstream moving item transporting top portion coplanar with said top surface, the longitudinal axis of said top portion extending in the direction of said axis from an upstream portion of said top surface downstream from said cash register support means to the downstream end portion of the top surface.

4,138,001

BRAKE MECHANISM

Arthur L. Lee, and Arthur B. Coval, both of Columbus, Ohio, assignors to A. L. Lee Corporation, Columbus, Ohio

Continuation of Ser. No. 641,941, Dec. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 508,741, Sep. 24, 1974, abandoned. This application Jul. 27, 1977, Ser. No. 819,461
Int. Cl.[2] F16D *59/02*
U.S. Cl. 188—170 **5 Claims**



1. An improved brake mechanism comprising,

a brake housing,

said brake housing including a first housing member and a second housing member, said first and second housing members being positioned in spaced relation,

a spacer member positioned between and in abutting relation with said first and second housing members,

bolt means extending through said first housing member, said spacer member, and said second housing member for releasably connecting said first and second housing members and said spacer member,

a chamber formed by said first and second housing members and said spacer member,

said chamber having a first open end portion and a second open end portion,

a brake actuator movably positioned within said chamber and having an end portion extending through said second open end portion of said chamber,

a lever member pivotally connected to said second housing member and having one end portion adjacent said brake actuator end portion,

a cup-shaped recess formed in said second housing member and positioned below said chamber,

an opening extending through said second housing member into said cup-shaped recess,

a slot in said brake housing formed by said first and second housing member and said spacer member, said slot being positioned adjacent to said recess and adapted to receive a rotor member,

a brake applicator slidably positioned within said recess, said brake applicator having an end portion extending out of said recess and through said opening of said second housing member to a position adjacent said lever other end portion,

said brake actuator being operable to pivot said lever and move said brake applicator into braking engagement with the rotor member,

means to urge said brake applicator into a brake disengaged position,

seal means surrounding said end portion of said brake actuator for sealing said second open end portion of said chamber,

said chamber being adapted to receive pressurized fluid from a source to overcome a force applied by said brake actuator,

a first annular member positioned in said chamber in abutting relation with said brake actuator,

an axial bore in said first annular member,

a second annular member positioned in said chamber and closing said first open end portion of said chamber,

an axial bore in said second annular member,

a rod member extending through said axial bores of said first and second annular members,

said rod member having a portion positioned within said axial bore of said first annular member and a portion positioned within said axial bore of said second annular member,

said rod member having an enlarged first end portion positioned for movement in said axial bore of said second annular member,

a retractor member positioned in said bore of said second annular member, a bore extending through said retractor member,

said rod member extending through said bore of said retractor member,

resilient means positioned between said first and second annular members and having opposite end portions positioned in abutting relation with said first and second annular members respectively,

said resilient means being operable to exert a preselected spring force through said first annular member upon said brake actuator and axially move said brake actuator to apply a force upon said brake applicator when the fluid pressure in said chamber is less than the force exerted by said resilient means on said brake actuator, and

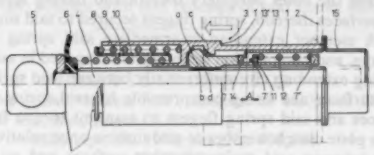
said retractor member being operable upon rotation to move said first and second annular members in abutting relation and compress said resilient means between said first and second annular members to permit removal of said first and second annular members, said resilient means, said rod member, and said retractor member as a single unit from said chamber first open end portion.

4,138,002

SLACK ADJUSTER FOR A RAIL VEHICLE BRAKE SYSTEM

Nils B. L. Sander, Osby, and Bertil S. P. Ottosson, Malmo, both of Sweden, assignors to SAB Industri AB, Malmo, Sweden

Filed Feb. 1, 1978, Ser. No. 874,214
Claims priority, application Sweden, Feb. 9, 1977, 7701400
Int. Cl.[2] F16D *65/56, 65/66*
U.S. Cl. 188—196 D **5 Claims**



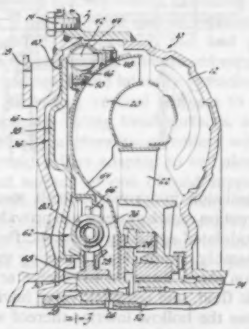
1. A slack adjuster for a rail vehicle brake system, comprising in combination, an axially movable adjuster tube adapted to receive an axially applied braking force in a brake application direction, a spindle axially movable within the tube, a nut in non-self-locking thread engagement with the spindle, two axially opposed clutch surfaces on the nut separated by a predetermined axial distance, two mating clutch surfaces on the tube separated by a greater axial distance than said predetermined distance between the nut clutch surfaces, a barrel spring coupled between the tube and the spindle biasing the spindle in the brake application direction, a thrust bearing about said spindle and said nut, a bias spring engaging the nut holding said thrust bearing in the brake application direction against a projection on said nut, and a control member fixed relative to axial movement of said tube having a member engaging said thrust bearing after the nut is moved by the spindle in the brake application direction a predetermined slack distance A from rest position.

4,138,003

VIBRATION DAMPER FOR A TORQUE CONVERTER LOCK-UP CLUTCH

John D. Malloy, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 12, 1977, Ser. No. 823,938
Int. Cl.[2] F16D *3/66*
U.S. Cl. 192—3.29 **3 Claims**



1. A torque converter, lock-up clutch and damper assembly comprising; input means adapted to be driven by a power source which delivers usable output torque and undesireable torsional vibrations, said input means including input shell and an impeller; output means including a turbine and an output shaft, said turbine being continuously drivingly connected to said output shaft and cooperating with said impeller to provide

a fluid drive which isolates said torsional vibrations; a lock-up clutch including a single plate clutch member selectively frictionally engageable with said input shell for receiving torque therefrom in drive bypassing relation with said fluid drive; and multiple stage torsional vibration damper means disposed between said single plate clutch member and said output means for permitting relative angular oscillations between said clutch member and said output means caused by said torsional vibrations, said vibration damper means including primary spring means comprising a spring housing secured to said turbine adjacent the outer periphery thereof and having spring abutting surfaces thereon, spring fingers secured to said single plate clutch member extending intermediate said spring abutting surfaces, and compression spring means disposed in said spring housing extending circumferentially between said spring abutting surfaces and being compressible by said spring abutting surfaces and said spring fingers to transmit torque from said single plate clutch member to said turbine upon relative movement between said spring abutting surfaces and said spring fingers and second spring means spaced radially from said primary spring means and connected in parallel drive relation therewith, said primary spring means being capable of transmitting only a part of said output torque and being continuously drivingly connected between said clutch member and said output means for permitting said relative angular oscillations at all times when said lock-up clutch is engaged, and after a predetermined amount of relative angular movement between said clutch member and said output means, said second spring means becoming drivingly connected between said clutch member and said output means and being capable of transmitting the remainder of said output torque.

4,138,004

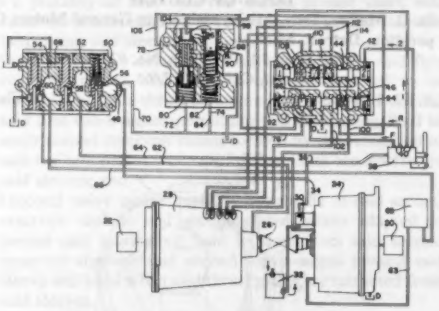
TRANSMISSION CLUTCHES WITH SEQUENCE VALVE AND PISTON-CONTROLLED PRESSURE MODULATOR

Joachim Horsch, Lombard, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation-in-part of Ser. No. 654,427, Feb. 2, 1976, Pat. No. 4,046,160. This application Jun. 29, 1977, Ser. No. 811,013

Int. Cl.[2] B60K *41/00*; F16D *25/11*

U.S. Cl. 192—3.57 **10 Claims**



1. In transmission hydraulic controls mechanism wherein speed and direction clutch systems are provided, both disposed to receive modulated actuating hydraulic fluid,

a valve assembly comprising a reducing valve **(126)** of hollow piston shape disposed to receive actuating main rail hydraulic fluid, said reducing valve having a fluid output **(134)** from the hollow interior thereof wherein the pressure of the fluid at the output is modulated in a range below main rail pressure and having an orifice **(154)** in the hollow piston end providing, from the valve interior, orifice-supplied control fluid; and

a control piston **(128)** associated with the reducing valve to receive said orifice-supplied control fluid for relatively separating the control piston from the reducing valve at a constant rate increasing the actuating pressure of the fluid at the reducing valve output, with said increase at constant rate;

a first clutch system **(F-R)** hydraulically disposed to communicate with the output of the reducing valve;

a second clutch system **(1-2-3)**;

multiposition valve means **(130)** connected in said output between the reducing valve and the first clutch system, and hydraulically disposed with respect to the second clutch system, between the reducing valve and the latter, so as to further modulate pressure of actuating fluid to be delivered to the second clutch system in a range below the already modulated output pressure aforesaid; and

means **(132)** for biasing said multiposition valve means so as to be moved from at least one former position into a position modulating actuating fluid delivered to the second clutch system whereby the actuating pressure thereof is functionally related to said increasing pressure at said output generally to constantly converge theretoward, and likewise with constant rate of increase of said actuating pressure.

4,138,005

MECHANICAL PRESS DRIVE ARRANGEMENT

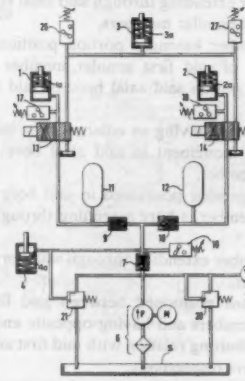
Franz Schneider; Eugen Waller, both of Goeppingen; Wolfram Büchler, Donzdorf, and Heinz Weber, Waschenbeuren, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 777,158

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610692

Int. Cl.[2] B60K *41/24*

U.S. Cl. 192—12 C **18 Claims**



1. A drive arrangement for a mechanically driven press, the press including at least one drive shaft mounted in a press frame, at least one of an eccentric and a crank being arranged on the drive shaft, and a clutch means operatively connected with the drive shaft for permitting a press stroke operation upon engagement thereof, the arrangement comprising:

at least two hydraulic brake means actively actuated into an operative position for braking the press between press strokes, and

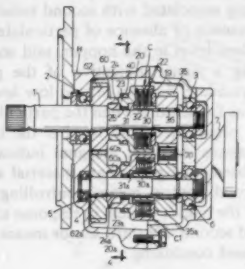
a hydraulic circuit means having at least two separate lines for controlling the operation of the clutch means and said at least two brake means.

4,138,006

POWER TRANSMISSION OF THE INTERLEAVED, MULTIPLE FRICTION PLATE CLUTCH TYPE

Carl I. Benson, Jr., Taunton, Mass., assignor to Paragon Gears Incorporated, Taunton, Mass.

Filed Oct. 31, 1977, Ser. No. 846,725
Int. Cl.[2] F16D *21/04, 21/06, 13/42*
U.S. Cl. 192—48.91 9 Claims



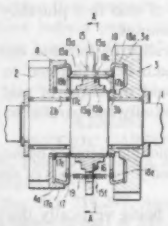
1. In a power transmission of the interleaved, multiple friction plate type, a rotatable shaft, a helical cam element fixed with said shaft, a friction plate type clutch mounted around said shaft and having a clutch drum member having a helical cam element which is cooperative with said helical cam element of said shaft, a gear journalled on said shaft for rotation relative thereto, a splined second clutch member integral with said gear for rotation therewith, interleaved friction plates splined to and located between said clutch members, and shifting means for axially shifting said drum member and its cam element to engagingly clamp up and disengage said friction plates, whereby clutch clamp up force and driving torque are transmitted through and by said cam element, said clutch drum member having internal splines and said second clutch member being formed as an axially extending hub from said gear and has external splines, said interleaved friction plates being splined to said clutch drum splines and said second clutch member splines.

4,138,007

SYNCHRONIZER

Takaoki Wakabayashi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 11, 1977, Ser. No. 795,842
Claims priority, application Japan, May 15, 1976, 51/61535
Int. Cl.[2] F16D *23/06*
U.S. Cl. 192—53 E 9 Claims



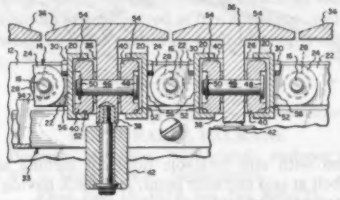
1. A synchronizer comprising a shaft having a longitudinally splined section, a pair of gears rotatably mounted on said shaft on opposite sides of said splined section, each of said gears having splines alignable with said splined section and having tapered surfaces, a pair of synchronizer rings including tapered surfaces complementary to and engageable with said tapered surfaces of said gears, respectively, and a plurality of axial extensions having stepped portions, the axial extensions of each of said rings extend toward each other with the extensions of one ring being superimposed on and coextensive with the extensions on the other ring, a sleeve member having splines disposed in sliding engagement with said splined section of said shaft and having recesses in which said extensions of said rings are positioned, said splines of said sleeve member being adapted to mesh with said splines of said gears and a single resilient detent means disposed between said sleeve member and said extensions of said rings to move said extensions with said sleeve until said stepped portions of said extensions are brought into contact with said recesses of said sleeve member.

4,138,008

HEAVY DUTY CONVEYOR

Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed Apr. 26, 1977, Ser. No. 790,964
Int. Cl.[2] B65G *7/12*
U.S. Cl. 198—365 6 Claims



1. An improved endless magnetic flow deflector article conveyor having a horizontal upper flight and a horizontal lower return flight for transporting an article on said horizontal upper flight along a predetermined path in a given horizontal direction, said conveyor being of the type having a plurality of transversely extending article carriers with outwardly facing article carrying support surfaces adjacent to one another in said given horizontal direction, each independently mounted for independent movement transversely of said given direction on one of a plurality of transversely mounted transversely extending support members, said support members mounted for concurrent movement in said given direction along the upper flight in one orientation and along the lower return flight in the opposite direction in an inverted orientation, said conveyor haing a magnetic guide means and a selectively actuable magnetic switch under said upper flight, and each of said article carriers having a downwardly extending magnetically attractable roller with a vertical axis of rotation whose path may be determined by said switch and said guide means, wherein the improvement includes improved support members having generally vertically and laterally extending web means for respectively providing vertical stiffness to said support members and vertically facing tread surfaces, and improved article carriers having a plurality of rollers with horizontal axes of rotation, said rollers adapted to roll along said vertically facing tread surface of one of said support members, whereby the problem of roller break-away resulting from increased friction caused by heavy articles and by the tendency for heavy articles to deform the elements of said conveyor is reduced to enable more reliable and rapid operation of said conveyor.

4,138,009

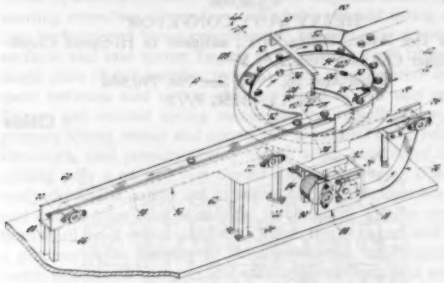
ENDLESS BELT PARTS TRANSPORTER

Steven L. Strong, Lapeer, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 24, 1977, Ser. No. 827,266
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—396 2 Claims

1. A material handling apparatus for transporting parts, said

apparatus comprising a bowl having an upright curved wall circumferentially surrounding a rotatable floor, said curved wall having an entrance point for said parts located at substantially the same elevation as said floor and an exit point for said parts located at an elevation higher than said floor, an endless belt having an inner edge and an outer edge, said belt being composed of a plurality of links collapsibly interconnected to allow the belt to bend in an edgewise direction, a track formed along the concave surface of said wall for supporting said belt for helical movement from said entrance point to said exit point, means extending radially outwardly in a curved form from the center of the bowl towards the outer edge of the floor and being normally positioned adjacent said entrance point for



cooperation with said rotatable floor for feeding said parts onto said belt at said entrance point, said track having an outer edge located adjacent said wall and an inner edge, an upstanding rail connected to said inner edge of said track and being engaged by and serving as a support for said inner edge of said belt, a portion of said track being inclined radially downwardly towards the center of said bowl so as to cause the parts carried by said belt to move by gravity towards said rail and engage the rail as the parts are moved from said entrance point to said exit point, and an opening formed in said rail along said portion of said track for causing improperly oriented parts to drop by gravity to said rotatable floor so as to be fed once again onto said belt at said entrance point.

4,138,010

CONTROLLED BUNKER SYSTEMS

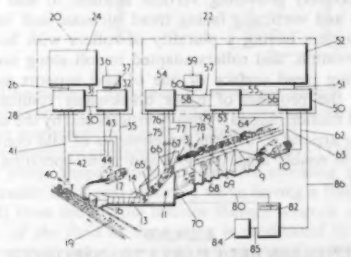
Brian G. Pidgeon, and Joseph Dowell, both of Burton-on-Trent, England, assignors to Coal Industry (Patents) Limited, London, England

Filed May 27, 1977, Ser. No. 801,377

Claims priority, application United Kingdom, Jun. 18, 1976, 25346/76

Int. Cl.[2] B65G *47/19*

U.S. Cl. 198—573 **10 Claims**



1. A control system for a bunker system having a particulate material storage bunker having discharge means for particulate material, feed means for feeding particulate material into said bunker, a hopper arranged adjacent to said discharge means for receiving particulate material from said feed means and from said discharge means, conveyor means, metering means and first sensor means, said conveyor, metering and first sensor means cooperating to convey material from said hopper at a preselected rate, said control system comprising

first and second control means, said first control means being associated with said metering means and first sensor means to control the rate of outfeed from the bunker system and said second control means controlling the operational mode of the bunker system, said second control means being associated with second sensor means for sensing the presence or absence of particulate material at a preselected low level in the hopper, said second sensor means deriving a signal indicative of the presence or absence of particulate material at said low level, and

third sensor means for sensing when the particulate material has reached a preselected high level in the hopper, said third sensor means deriving a signal indicative of the presence or absence of particulate material at said high level, said second control means controlling the operational mode of the bunker system in response to the signals derived by said second and third sensor means and indicative of the sensed conditions.

4,138,011

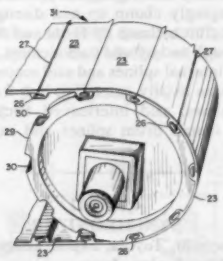
NON-PIVOTAL MODULAR CONVEYOR BELT AND MODULAR LINKS THEREFOR

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation of Ser. No. 681,031, Apr. 28, 1976, abandoned. This application Nov. 2, 1977, Ser. No. 847,790

Int. Cl.[2] B65G *15/22*

U.S. Cl. 198—844 **2 Claims**



1. For use in making up a conveyor belt, a module comprising:

a. a first plurality of joinable ends of substantially identical width, each being formed to surround a non-pivotal opening, said openings of said first plurality being aligned on the axis of said openings,

b. a second like plurality of joinable ends of substantially identical width, each being formed to surround a non-pivotal opening, said openings of said second plurality being arranged coaxially and parallel to said first plurality of openings,

c. a relatively thin bendable member homogeneously formed with and joining said joinable ends of said first and second pluralities,

d. said joinable ends being vertically thicker than said thin bendable member and being dimensioned and spaced apart by a distance slightly greater than said width so that a plurality of said modules may be engaged with each other at said ends,

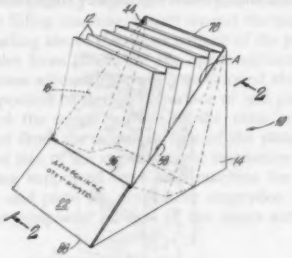
e. said joinable ends having upper surfaces which are co-planar with the bottom surface of said bendable member,

f. said upper surfaces adapted to slidably fit beneath and engage the bottom surface of the mating bendable member when said module is joined to a like module in making up a conveyor belt.

4,138,012
CARTON FOR HOLDING AND DISPLAYING A STACKED ARRAY OF FLAT RECTANGULAR BOXES

Daniel P. Dutcher, Woodbury, and Robert A. Bliss, St. Paul, both of Minn., assignors to Champion International Corporation, Stamford, Conn.

Filed Jan. 19, 1978, Ser. No. 870,739
Int. Cl.[2] B65D *5/54*
U.S. Cl. 206—45.19 **6 Claims**



1. A carton for holding and displaying a stacked array of generally flat rectangular boxes disposed at an inclined angle to the vertical, said carton comprising:

a base;

first and second upstanding side panels, each of said side panels being hingedly connected to said base, said side panels being substantially triangular in configuration;

first and second pairs of cushion flaps, each of said pairs of cushion flaps being hingedly connected to one of said side panels, each of said cushion flaps being substantially triangular in configuration;

a composite rear panel formed of four interengaging flaps respectively connected to said side panels and said base;

an interior inclined wall member hingedly connected at its top edge to the top edge of said composite rear panel, each of the opposite side edges of said interior wall member being hingedly connected to one of said pairs of cushion flaps;

a base support member hingedly connected to the lower edge of said inclined wall member and disposed flush against said base;

first and second side support members, each of said side support members being hingedly connected to one of said side panels, and extending from its respective side panel toward the opposite side panel;

an inclined indicia panel hingedly connected to said base and disposed one the top surfaces of said side support panels; and

a plurality of locking flaps hingedly connected in succession to said inclined indicia panel, said locking flaps being disposed on the lower surface of said side support members.

4,138,013
ENTERIC CAPSULES

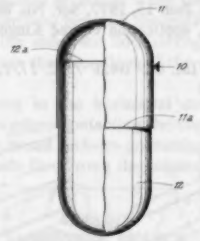
Yakutaro Okajima, Fukazawa, Japan, assignor to Parke, Davis & Company, Detroit, Mich.

Continuation of Ser. No. 718,297, Aug. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 568,974, Apr. 17, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 805,763
Int. Cl.[2] A61K *9/58*
U.S. Cl. 206—528 **6 Claims**

1. A hard-shell pharmaceutical capsule comprising telescopically engaged body and cap portions having enteric properties, being characterized by relative freedom from brittleness and by substantial absence of degradation on exposure to artificial gastric juice for 120 minutes, and the body and cap portions being formed by the dip-moldng technique from a homogeneous film-forming composition comprising a member of the group consisting of

(1) hydroxypropyl methylcellulose and an ammonium salt of cellulose acetate phthalate polymer, and

(2) gelatin and an ammonium salt of a copolymer of methacrylic acid and methacrylic acid ester,

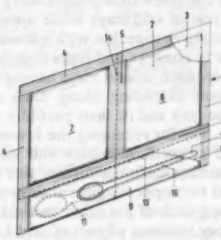


the capsule having the proportion of 5 parts by weight of the ammonium salt, measured as free acid form, to 1 to 5 parts by weight of the gelatin or hydroxypropyl methylcellulose.

4,138,014
RUPTURABLE PACKAGE

Cornelis Bouman, Maasdam, Netherlands, assignor to W. van Oordt & Co. Holding B.V., Netherlands

Filed Jun. 15, 1977, Ser. No. 806,721
Int. Cl.[2] B65D *17/24, 69/00*
U.S. Cl. 206—542 **4 Claims**



1. A rupturable package containing ingredients for the preparation of, or addition to, a drink or food, comprising:

two generally planar sheet-like walls directly interconnected by binding zones,

said walls defining between them a plurality of compartments at least some of which contain different ingredients,

said compartments being separated from each other by some of said binding zones, and

at least one of said compartments being of elongated shape with one of its longitudinal edges adjoining co-extensive edges of at least two other compartments, said elongated compartment adapted to contain a utensil,

said binding zones further including at least two inner binding zones having weakened tear lines formed in or at least adjacent thereto between said compartments,

said tear lines intersecting each other and being perpendicular,

one of said tear lines extending between said elongated compartment and said two other compartments to provide easy severance of said two other compartments from said elongated compartment,

the other of said tear lines extending between said two other compartments and across said elongated compartment to provide easy severance of said two other compartments from each other and to provide easy opening by severance

of said elongated compartment along the tear line extending thereacross.

4,138,015

STORAGE TRAY ASSEMBLY

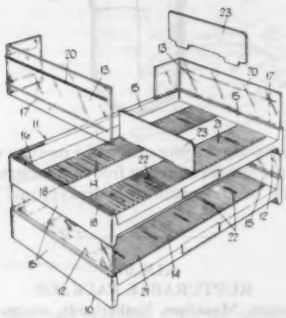
Derek S. Rabley, London, England, assignor to M. Myers & Son Limited, West Midlands, England

Filed Jun. 15, 1977, Ser. No. 806,851

Claims priority, application United Kingdom, Jun. 18, 1976, 25313/76

Int. Cl.[2] B42F *7/12, 17/12*

U.S. Cl. 206—561 **5 Claims**



1. A storage tray combination comprising at least two separate trays of generally rectangular form and at least two separately formed sidewall members of L-shaped configuration, lower portions of the sidewall members being engageable with an upper part of one of said trays while upper portions of the sidewall members are engageable with a lower part of another of said trays so as to connect said trays together in a vertically spaced relationship, each of said trays having an upper surface defining slot means extending along each of two opposite lateral sides of the tray and at least partially along one of the other sides of the tray for receiving the lower portions of two of said L-shaped sidewall members and each of said trays having a lower surface defining further slot means extending along each of said two opposite lateral sides of the tray and at least partially along each of the other two sides of the tray for receiving the upper portions of two of said L-shaped sidewall members, whereby said trays can be arranged together in said vertically spaced relationship in either of two alternative positions obtained respectively by turning said one tray horizontally through 180° relative to said other tray and in each of which positions the trays are arranged in a vertically aligned relationship.

4,138,016

SLIDE TOP DISPENSER CARTON

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Apr. 27, 1978, Ser. No. 900,519

Int. Cl.[2] B65D *5/72, 5/70*

U.S. Cl. 206—620 **4 Claims**

1. A slide top closure dispensing carton comprising:

a front wall, a rear wall, and a pair of opposed side walls connecting said front wall to said rear wall,

one of said side walls including a two-ply construction, and a top closure including

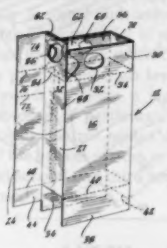
a flap hingedly connected to the other of said side walls,

a flap hingedly connected to each ply of said one of said side walls and disposed in overlapping relation,

the innermost one of said side wall flaps of said two-ply side wall construction including an opening therethrough and being adapted to overly and rest upon the other of said side wall flaps,

the outermost flap of said two-ply side wall construction being hingedly connected to said side wall for movement towards and away from said side wall and said innermost one of said flaps of said two-ply wall construction, said outermost one of said flaps of said two-ply wall construction being bent about a score line to rest upon the innermost one of said flap extensions of said two-ply side wall construction to overly and close the opening formed therethrough, and

a top closure flap hingedly connected to said front and rear walls, each of said top closure flaps including an opening



therethrough adapted to be placed in registration with each other when said flaps are overlapped on top of said carton, said top closure flaps being adhesively secured together, and

the outermost side flap of said two-ply side wall being slidable relative to said overlapped and secured top closure flaps so as to enable the opening in the innermost one of said side wall flap extensions to be brought into registration with the registered openings in said top wall closure flaps.

4,138,017

DEVICE FOR SELECTING AND REMOVING UNSATISFACTORY CAPSULES BEFORE FILLING SATISFACTORY CAPSULES WITH CHEMICALS

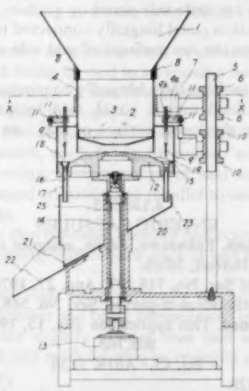
Toshiharu Itoh, Osaka, Japan, assignor to Kabushiki Kaisha Osaka Jidoki Seisakusho, Sakai, Japan

Filed Apr. 20, 1977, Ser. No. 789,276

Claims priority, application Japan, Oct. 8, 1976, 51/121417

Int. Cl.[2] B07C *1/10*

U.S. Cl. 209—680 **6 Claims**



1. An apparatus for removing deformed capsules from a plurality of capsules to be fed to a capsule filling machine, said apparatus comprising a stationary hopper at the top of the apparatus and having an opening in the bottom thereof, a capsule receiving plate positioned immediately below the

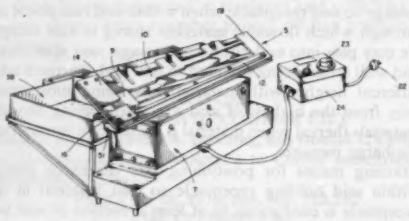
bottom opening of said hopper and having the upper surface inclined from the center of the plate toward the periphery thereof, means connected to said plate for moving said plate while it remains in position below said hopper for facilitating the movement of capsules from the hopper toward the periphery of the plate, said plate having a plurality of holes around the peripheral portion of the upper surface thereof and pipes extending through said plate from said holes with the internal diameter of the pipes being only slightly larger than the diameter of the cap of an acceptable capsule, and inclined guide below said plate for guiding capsules which pass through said pipes to a capsule filling machine, a wall around the periphery of said plate extending above the upper surface of the plate for preventing capsules from falling off the upper surface of the plate, and stagnation adjusting members positioned above the outer peripheral portion of the upper surface of said plate and depending toward the upper surface of the plate with the lower ends spaced from the upper surface of the plate a distance less than the size of the capsules, said stagnation adjusting members being supported from said machine for lateral oscillation above said plate for preventing stagnation of capsules on the outer peripheral portion of the upper surface of said plate.

4,138,018

APPARATUS AND METHOD FOR SORTING SUBSTRATES

Donald H. Daebler, and John H. Morgan, both of Albuquerque, N. Mex., assignors to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Jun. 9, 1977, Ser. No. 804,960
Int. Cl.[2] B07B *13/04*; B07C *5/04*
U.S. Cl. 209—633 **10 Claims**



1. Apparatus for sorting substrates into groups according to magnitudes of at least a broad dimension thereof, comprising:

a member having a base and a pair of sides which extend from the same one edge of the base in a first plane and are spaced apart for defining an opening therebetween that has a width which is greater than at least twice the width of substrates for being sorted, first surfaces of the base and sides being flat and in the first plane;

first support means for supporting the member with the first plane inclined at an angle of less than 90° with respect to the horizontal, for movement of a substrate thereon in one horizontal direction in the first plane;

a first guide secured to and extending above the first surface of the base and having one edge thereof adjacent to and spaced a prescribed distance below the one edge of the base that is adjacent the opening, the length of the first guide being greater than the shortest spacing between the sides of said member;

a second guide having a length which is at least substantially equal to the spacing between adjacent edges of the sides and having a flat top surface;

second support means for supporting the second guide in the opening between the sides with the flat top surface thereof being in the first plane and one edge thereof being adjacent to and spaced from the one edge of the base for defining an opening therebetween;

the one edges of each of said first and second guides having at least one straight elongated line portions that are parallel to each other and the first plane, the one edge of at least one of said guides also having a plurality of straight line portions thereof in the first plane which are parallel to each other, the spacing between straight line portions of the one edges of the first and second guides contacting one edge and one broad side, respectively, of a substrate located thereon periodically increasing in a stepwise manner in the one direction such that when the length of a substrate in the direction between the guides is less than this spacing that the substrate falls through the associated opening between the one edges of the second guide and the base; and

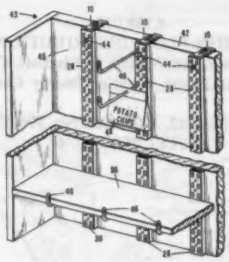
means for moving in the horizontal direction substrates having bottom edges contacting the one edge of the first guide and one broad surfaces contacting the one edge of the second guide for sorting the substrates.

4,138,019

MOUNTING DEVICE

Jack R. Smith, Jacksonville, Fla., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Jul. 5, 1977, Ser. No. 812,726
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—87 **15 Claims**



1. An adjustable mounting device suitable for use with a horizontal support surface to hold packaged goods on display, said mounting device comprising:

a first angle member having a first leg portion, with an opening therethrough, and a second leg portion, with an elongated slot therethrough, said second leg portion extending at substantially a right angle from said first leg portion, said second leg portion elongated slot being generally perpendicular to the junction of the first angle member first leg portion and second leg portion;

a second angle member having a first leg portion with an opening therethrough, and a second leg portion, said second leg portion extending at substantially a right angle from said first leg portion;

at least one of said first angle member first leg portion opening and said second angle member first leg portion opening being an elongated slot whose length is generally perpendicular to the junction of the first leg portion and the second leg portion of that angle member;

first connecting means for passing through said first angle member first leg portion opening and said second angle member first leg portion opening to adjustably connect said first and second angle members for support on a horizontal support surface;

said first leg portion of said second angle member being capable of parallel placement beneath said first leg portion of said first angle member with said second leg portion of said second angle member being alternatively positionable either closer to said second leg portion of said first angle member than said opening in said first leg portion of said second angle member, or farther from said second leg

portion of said first angle member than said opening in said first leg portion of said second angle member;

an elongated support strip having a plurality of attachment openings therethrough spaced at intervals along the length of said support strip and a first plurality of support openings therethrough spaced at intervals along the length of said support strip;

said first angle member second leg portion elongated slot being registerable with each of said plurality of attachment openings;

second connecting means for passing through each of said plurality of attachment openings for adjustably locating said first and second angle members at a predetermined position along the length of said support strip whereby said angle members can be attached to said support strip along its length at each of said plurality of attachment openings and further adjusted along said second leg portion elongated slot of said first angle member, as well as adjustably connected to each other for attaching said support strip to said horizontal surface enabling adjustment in a vertical and horizontal position; and

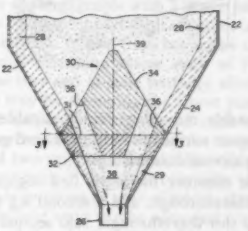
support means removably extending from at least one of said support openings.

4,138,020

REGENERATION FLOW DISTRIBUTION DEVICE

Peter Steiner, Edison, and William F. Bischoff, Califon, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed May 13, 1977, Ser. No. 796,634
Int. Cl.[2] B65G *65/40*
U.S. Cl. 214—17 C **16 Claims**



7. In combination with a regeneration vessel for the thermal regeneration of an adsorbent material, means for introducing into the vessel a saturated adsorbent material from an adsorption source, means for introducing into the vessel a heated, inert material from a second source, and a discharge means disposed adjacent the exit portion of said vessel, a flow distribution device for controlling the uniform distribution of the flow of the mixture of said adsorbent material and said inert material from said discharge means, said device comprising:

a bi- conically-shaped element having upper and lower conical surface portions, said surface portions being conical surfaces of revolution about a longitudinal axis of said element and having their respective base portions meeting at a plane orthogonal to the longitudinal axis of said element, said lower conical portion truncated by a plane parallel to said first-mentioned plane; and

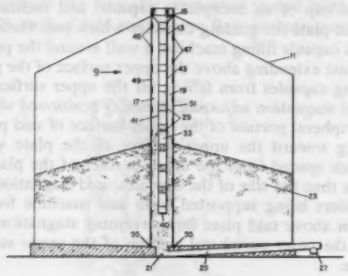
a plurality of through passages extending substantially longitudinally of said element, each of said passages being disposed at a predetermined angle greater than 45° and less than 90° relative to said first-mentioned plane, each of said passages having an entrance opening on said upper conical surface and an exit opening on said truncated surface.

4,138,021

DUCTED MATERIAL HANDLING DEVICE FOR TOP UNLOADING OF A STORAGE RECEPTACLE

Bruce A. McKenzie, Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Jul. 25, 1977, Ser. No. 818,299
Int. Cl.[2] B65G *65/32, 65/34*
U.S. Cl. 214—17 C **25 Claims**



1. A material handling device for use in a material holding receptacle, said device comprising:

an inlet passage positionable within a holding receptacle for loading flowable materials into said receptacle, said inlet passage having apertures therein opening into said receptacle;

wall means defining a discharge passage positionable within said holding receptacle contiguous to and extending at least partially along said inlet passage, said wall means having a plurality of spaced apertures therein opening said passage to said receptacle when within said receptacle and through which flowable materials stored in said receptacle may pass into said discharge passage, said apertures in said wall means being oriented so that said apertures are at different heights with material flow being substantially only from the highest of said apertures having flowable materials thereat when material is withdrawn through said discharge passage;

positioning means for positioning said discharge passage within said holding receptacle so that material in said receptacle is contiguous to at least a portion of said wall means having said apertures therein; and

discharge means communicating with said discharge passage and through which material is withdrawn from said discharge passage resulting in additional material in said receptacle being drawn into said discharge passage substantially only through said higher one of said apertures so long as said material is contiguous to a said higher one of said apertures.

4,138,022

FURNACE TOP CHARGING APPARATUS

Toshio Mochizuki; Shuji Kajikawa; Keitaro Hirai, all of Fukuyama, and Masaaki Yasunaga, Hiroshima, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1977, Ser. No. 842,371
Claims priority, application Japan, Nov. 26, 1976, 51/141991; Oct. 29, 1976, 51/146499[U]
Int. Cl.[2] F27B *1/20*
U.S. Cl. 214—35 R **8 Claims**

1. In a furnace top charging apparatus of the bell-less type comprising:

a plurality of bunkers;

exhaust ports positioned on a lower portion of said bunkers;

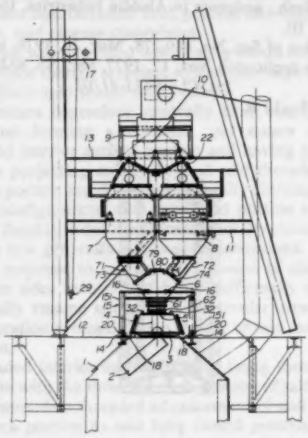
a collecting chute positioned below said exhaust ports for receiving materials discharged from said exhaust ports;

a vertical chute positioned below said collecting chute;

a rotating drive chamber operatively connected to a lower end of said ver ical chute;

a rotary distribution chute positioned below said vertical chute, one end being pivoted to the rotary drive chamber, said rotary distribution chute, being adapted to throw raw material into a furnace after passing through said vertical chute; wherein the improvement comprises;

guide rails positioned on a floor under said bunkers on both



sides of said rotating drive chamber said guide rails extending to an off-line position;

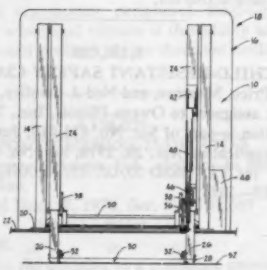
a portal truck mounted on said guide rails, said portal truck being adapted to support said collecting chute during charging operation and to transport said collecting chute and rotary drive chamber to said off-line position when desired.

4,138,023

VEHICLE WHEELCHAIR LIFT

Donald L. Rohrs; Harold A. Downing, and Donald L. Collins, all of Hutchinson, Kans., assignors to Collins Industries, Inc., Hutchinson, Kans.

Filed Oct. 18, 1976, Ser. No. 733,242
Int. Cl.² B60P *1/46*
U.S. Cl. 214—75 R **6 Claims**



1. In a vehicle having a door opening and a floor, a lift for loading and unloading said vehicle, said lift comprising:

a pair of stanchion tubes disposed on each side of the opening of the vehicle, means attaching the lower portion of said tubes to said floor;

a pair of hydraulic cylinder housings, means pivotally attaching the top of said housings to the top of said stanchion tubes;

hydraulic cylinder means mounted inside each of said hydraulic cylinder housings;

telescoping channel means slidably mounted in said hydraulic cylinder housings and attached to the ends of said hydraulic cylinder means;

a horizontally disposed base channel, said channel attached to the ends of said telescoping channel means;

a platform having one end pivotally attached to said channel;

pivot means attached to one of said hydraulic cylinder housings for selectively engaging, pivoting and releasing said platform and to pivot said platform between a vertical and a horizontal position;

means attached to one of said hydraulic cylinder housings and said pivot means to actuate said pivot means; and

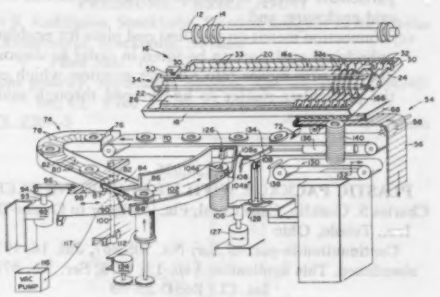
means on said platform engageable by said pivot means when said platform is in a predetermined position.

4,138,024

APPARATUS AND METHOD FOR STACKING ROLLS OF PRESSURE SENSITIVE TAPE

Ernest C. Hiscoe, Hudson, N.H., assignor to Nashua Corporation, Nashua, N.H.

Division of Ser. No. 622,155, Oct. 14, 1975, Pat. No. 4,030,619.
This application Feb. 7, 1977, Ser. No. 766,340
Int. Cl.² B65G *57/00*
U.S. Cl. 214—152 **5 Claims**



1. In the manufacture of rolls of pressure sensitive tape wherein a plurality of said rolls are carried on a mandrel in a spaced relationship, the method of stacking said rolls comprising in combination,

interposing divider members between adjacent rolls on the mandrel,

drawing the mandrel clear of the rolls,

storing rolls thus cleared in said spaced relationship,

periodically transferring the rolls thus stored to a feeder area,

serially removing the rolls from said feeder area without contact between the faces of any of the rolls,

stacking the rolls thus removed,

placing a release sheet between the adjacent faces of the rolls as they are stacked, and

removing the stack when it has a predetermined number of rolls.

4,138,025

UNLOADING DEVICE

Alvin B. Kennedy, Jr., P.O. Box 282, Angleton, Tex. 77515

Continuation of Ser. No. 743,763, Nov. 22, 1976, abandoned.
This application Mar. 15, 1978, Ser. No. 886,795
Int. Cl.² B65B *21/02*; B65G *65/04*
U.S. Cl. 214—318 **8 Claims**

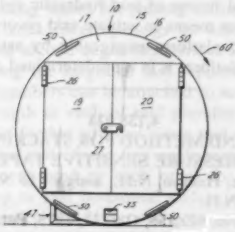
1. An apparatus for enabling dry particular matter in barrels to be safely unloaded in bulk quantities, including:

(a) a cylindrical enclosure including a right circular cylinder and first and second end plates covering the respective first and second ends of the cylinder;

(b) door means in the first end plate for providing access into said enclosure when said door means are in an opened position;

(c) a rack frame mounted inside said enclosure adjacent the edges of said door means for receiving and supporting the barrels of dry particulate matter during dumping of same;

(d) door closure means formed in a top portion of the second end plate, the top portion of the second end plate being the portion adjacent the open top of said barrels when supported by said frame, whereby when said cylindrical enclosure is rotated 180° about its cylindrical axis, the particulate matter is dumped out of said barrels and into said enclosure; and



(e) connection means on said first end plate for enabling said cylindrical enclosure to be tilted in order to dispose said door closure means into a lower position which enables the particulate matter to be dumped through said door closure means.

4,138,026

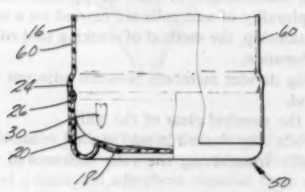
PLASTIC PACKAGE WITH HEAT SHRUNK SLEEVE

Charles S. Conklin, Cape Coral, Fla., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 705,867, Jul. 16, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 871,288

Int. Cl.[2] **B65D** *23/08*

U.S. Cl. 215—12 R **8 Claims**



1. In a package comprised of an uprightly unstable biaxially oriented thermoplastic polyester bottle and a generally cup-shaped base telescopically and securely mounted on the bottom of the bottle for supporting the bottle in a stable upright position, said bottle including a generally cylindrical body portion and a circumferential groove formed in said body portion adjacent the bottle bottom and having a venting passageway disposed between the bottle bottom and said groove and wherein said base includes a tubular wall portion essentially of the same diameter as the bottle body portion and having an inwardly extending radial lip positioned within said groove, the improvement comprising a heat shrunk, contaminant impermeable, foamed thermoplastic, tubular label in snug, peripheral engagement with external surfaces of said body portion of said container and said tubular wall portion of said base and sealingly bridging the juncture betwen said base and said bottle for precluding entry of contaminants through said groove and/or passageway into said base, said label terminating within the confines of said base tubular wall portion so that the package is supported in an upright position on the uncovered bottom of said base.

4,138,027

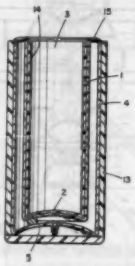
VACUUM BOTTLE CONSTRUCTION

Alva L. Frye, Brentwood, and Herbert M. Stewart, Nashville, both of Tenn., assignors to Aladdin Industries, Incorporated, Chicago, Ill.

Continuation of Ser. No. 669,278, Mar. 22, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,290

Int. Cl.[2] **A47J** *41/02*

U.S. Cl. 215—13 R **15 Claims**



1. A vacuum insulated container comprising:

(a) a first metallic cylinder open at the top thereof;

(b) a second metallic cylinder open at the top thereof and of a larger diameter than said first cylinder, said first cylinder positioned inside and uniformly spaced from said second cylinder to define an annular space therebetween;

(c) means for securing the tops of said cylinders, one to the other, to seal said annular space, said annular space being substantially evacuated;

(d) said cylinders having a thickness such that said first cylinder can withstand the pressure differential between atmospheric pressure and the reduced pressure of said evacuated annuar space without substantial deformation, said second cylinder requiring mechanical support to withstand said pressure differential;

(e) a jacket encasing said second cylinder in intimate contact therewith formed of a rigid material, said jacket providing the mechanical support to said second cylinder to prevent deformation thereof.

4,138,028

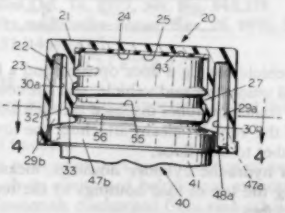
CHILD-RESISTANT SAFETY CLOSURE

James H. Price, Maumee, and Ned J. Smalley, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 811,410, Jun. 29, 1977. This application Apr. 20, 1978, Ser. No. 897,316

Int. Cl.[2] **B65D** *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—216 **22 Claims**



1. In a child-resistant safety closure adapted for threadable attachment on a container having a generally cylindrical hol-

low dispensing end including an exteriorly threaded neck portion, an annular rim defining a dispensing opening, an interlocking member orientationally arranged to interlock said closure on said dispensing end when said closure is threadably advanced to a fully closed position on said neck portion, and a peripheral shoulder having a concentric edge surface defining a continuous smoothly surfaced exterior sealing surface disposed between said threaded neck portion and said interlocking member, said closure comprising:

a closed end wall provided with sealing means on the underside surface thereof arranged to seal said dispensing opening in fluid-tight sealed relationship,

annular means depending integrally from said closed end wall and forming a sidewall, said means defining a threaded interior surface portion and having a distal end portion projecting axially beyond said threaded interior surface portion and defining a generally circular cross-sectional configuration, said distal end portion being sufficiently flexible to deform from a generally circular configuration to a generally elliptical cross-sectional configuration in response to manual compression of diametrically opposite sides thereof and being sufficiently resilient to essentially resume said generally circular cross-sectional configuration promptly upon release of said manual compression,

said threaded interior surface portion being threadably engageable with the threaded neck portion of said container to accommodate threaded advancement of said closure on said neck portion to said fully closed position in which said sealing means assumes fluid-tight sealing relationship with said dispensing opening;

an interlocking member integrally formed on the distal end portion of said closure and adapted to override interlocking engagement with the interlocking member on said container in response to normal threaded advancement of said closure on said neck portion, but to intercept the latter interlocking member in interlocking engagement in response to normal threaded retrogressive movement of said closure on said neck portion, and said interlocking engagement being releasable in response to manual compression and concurrent threaded retrogressive movement applied to a resiliently distensible annular sealing flange projecting divergently inward from said sidewall and said interlocking engagement;

the improvement wherein

said sidewall of said closure includes a resiliently distensible annular sealing flange projecting divergently inward from said sidewall and adapted to seat against the peripheral exterior sealing surface on the dispensing end of said container in continuous, peripheral, fluid-tight, sealing relationship when said closure is threadably advanced to said fully closed position on the threaded neck portion of said container.

4,138,029

BAND TIGHTNESS INDICATOR

William P. Mahoney, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

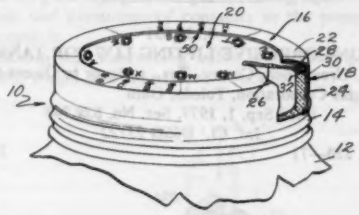
Filed Dec. 17, 1976, Ser. No. 751,689
Int. Cl.[2] B65B *7/28*
U.S. Cl. 215—230 **10 Claims**

1. A closure for the opening in a container provided with a threaded portion, which closure comprises:

a top apertured, bezeled, threaded band;

a disk disposed under the apertured top of the band and having sealingly provided on one side thereof a predetermined compressible sealing material requiring a corresponding predetermined degree of compression against the container opening to effect a desired sealing relationship therebetween and having on the other side of said disk at least two indicia spaced apart angularly of the disk by an amount substantially equal to a predetermined amount through which the closure band must be further threadably turned once its bezel just touches the disk to effect said desired sealing relationship between the compressible sealing material and the container opening;

a first one of said indicia cooperating with said band by identifying a specific selected portion thereof opposite



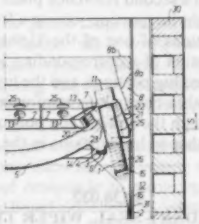
said first indicia once the bezel just touches the disk and a second one of said indicia indicating said desired sealing relationship when further turned to be situated opposite said specific selected portion of the band.

4,138,030

PRESSURE VESSEL JOINT

Gustav S. Andersson, Stockholm, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Mar. 10, 1978, Ser. No. 885,325
Claims priority, application Sweden, Apr. 13, 1977, 7704249
Int. Cl.[2] F16J *13/06, 15/14;* **B65D** *51/00*
U.S. Cl. 220—3 **5 Claims**



1. A joint between a pressure vessel lid (5) and a pressure vessel comprising a thin-walled container (2) which is supported by an external support structure (30, 12, 16), said joint comprising

an annular flange (1) which is directed towards the container axis, and which is fastened at the rim of the inner container (2),

screws which are arranged to clamp the rim of the lid (5) onto the flange (1), and

a sealing gasket (4) between the flange (1) and the lid (5), characterized in that the support structure (30, 12, 16) which extends axially past the container rim on its inside beyond the container rim exhibits a support ring (8) with a support surface (8*a*) facing the interior of the container

that a gap is present between the peripheral edge of the lid and the support surface (8*a*)

that blocks (7) are positioned in the gap, said blocks having a recess (20) for the upper edge of the lid (5)

that the screws (11) extend through the blocks (7) and clamp, via the blocks (7), the lid (5) against the flange (1),

that in the unloaded condition of the pressure vessel, an axial play (S) is arranged between the support surface (8*a*) and that side of the blocks (7) facing the support surface (8*a*), said play (S) being adapted to be eliminated for a pressure vessel pressurization, which brings about a container elongation substantially equal to the play, and

that a lubricant (16) is arranged between the support structure at least part of the surface of the container,

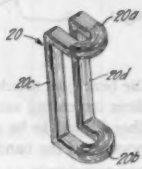
whereby the screws (11) only need stand the load referring to said vessel pressurization and the load referring to required comprimation of the gasket.

4,138,031

NON-CORROSIVE LIFTING LUG FOR TANKS

Mark E. Greenwood, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 1, 1977, Ser. No. 829,748
Int. Cl.[2] B65D *25/22*
U.S. Cl. 220—71 **2 Claims**



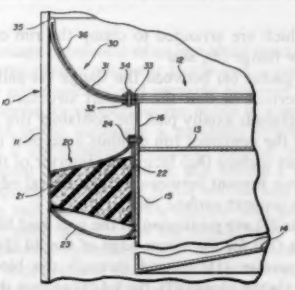
1. A non-corrosive lifting lug for tanks, the lug comprising a pair of generally flat, spaced U-shaped lug portions generally parallel to a first reference plane and each having a bight portion connecting a pair of straight parallel spaced leg portions, and a pair of generally flat, spaced straight lug portions joining free end portions of the leg portions of the U-shaped lug portions, the straight lug portions being generally parallel to each other and to a second reference plane perpendicular to the first, each straight lug portion joining a free end portion of one of the leg portions of one of the U-shaped lug portions with a free end portion of a corresponding leg portion of the other of the U-shaped lug portions, and the lug being formed of resin reinforced with a continuous reinforcing strand extending repeatedly through the straight lug portions longitudinally thereof and the U-shaped lug portions in the U-shape thereof.

4,138,032

FULL SECONDARY SEAL, WIPER TYPE, FOR A FLOATING ROOF TANK

John S. McCabe, Naperville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Sep. 26, 1977, Ser. No. 836,577
Int. Cl.[2] B65D *87/207*
U.S. Cl. 220—224 **11 Claims**



1. In a vertical cylindrical liquid storage tank of imprecise circularity having a circular floating roof of smaller diameter than the tank thereby defining a vapor space between the roof edge and the tank wall, an improved sealing means for substantially preventing flow of vapor from a liquid product stored in the tank through the vapor space to the atmosphere, said sealing means including:

an elastomeric composite strip impermeable to vapor connected at its inner edge by an essentially vapor tight joint to the roof edge and extending as an annulus outwardly to the tank inner side wall,

the elastomeric composite strip comprising a plurality of flexible resilient elongated stiffeners laterally positioned and embedded in elastomeric material,

the elongated stiffeners extending from the strip edge joined to the roof and terminating short of the strip edge at the tank wall, and

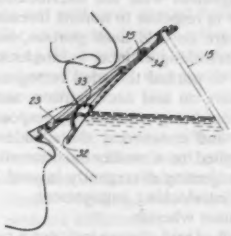
said elastomeric strip flexing in a vertical arc as the roof moves toward and away from any adjoining tank wall portion, with circumferential stretching and contraction of the strip at its outside periphery unrestrained by the stiffeners thereby permitting the strip to very readily and efficiently contact and accommodate to the contour and spacing of the tank wall from the roof edge to maintain sealing contact with the tank wall above the vapor space as the roof moves laterally and vertically and thus keep vapor from escaping.

4,138,033

LIQUID CONTAINER LID

Larry E. Payne, 3224 Wesley Chapel Rd., and Kenneth D. Lancaster, Jr., 965-C Clubhouse Cir., W., both of Decatur, Ga. 30034

Filed Jan. 16, 1978, Ser. No. 869,520
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—254 **5 Claims**



1. A lid for fastening onto the rim of a liquid container, comprising:

(a). a first portion having an outer periphery and means on said periphery for detachably connecting said lid to said rim, said first portion having an aperture therethrough; and

(b) a second portion integrally connected to said periphery of said first portion by a hinge means, said hinge means including a fold-line, said second portion capable of being rotated about said fold line to underly and to be normally biased in mating and sealing engagement with said aperture when said lid is connected onto said rim, said second portion being elastically depressible to provide access to said container when force is applied thereto and returning to sealing engagement with said aperture when force is removed therefrom.

4,138,034

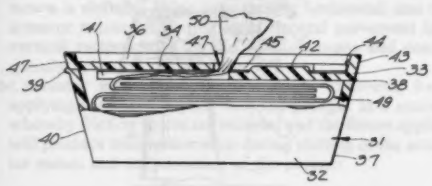
PACKAGE FOR DISCRETE PRE-MOISTENED INTERLEAVED SHEETS AND THE POP-UP DISPENSING THEREOF

Robert F. McCarthy, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 5, 1976, Ser. No. 711,929
Int. Cl.[2] A47K *10/24*; B65H *1/00*
U.S. Cl. 221—48 **9 Claims**

1. A dispensing package and a plurality of sheets pre-mois-

tened with a volatile compound and so arranged in said package that each sheet to be dispensed is discrete from the next succeeding sheet to be dispensed and when dispensed will carry said next succeeding sheet to a dispensing position, said package comprising a tray containing said sheets and a cover for said tray, said cover comprising a pair of opposed first and second flaps hingedly attached to said tray, said first flap being swingable between an open position and a closed position overlying said tray, said first flap having a free end with a substantially V-shaped notch formed therein, said second flap being swingable between an open position and a closed position overlying said tray and said first flap, said second flap



having an opening formed therein, means to maintain said flaps in their closed positions, a portion of said opening of said second flap overlapping said V-shaped notch of said first flap to form a dispensing orifice when said flaps are in their closed positions, said dispensing orifice being so dimensioned as to just permit two of said pre-moistened sheets in tightly gathered form to be manually drawn therethrough, whereby when each sheet is manually extracted from said tray through said dispensing orifice it will pull a sufficient amount of the next succeeding sheet through said dispensing orifice to enable manual extraction thereof and to serve as a plug for said dispensing orifice to minimize dry-out of the remaining sheets within said tray.

4,138,035

METHOD FOR DISCHARGING HIGH-PRESSURE GAS-OCCLUDING LIQUID AND DEVICE THEREFOR

Shigeru Ueda; Kazuo Makino; Yoshinori Nakata; Yoshihisa Hasegawa; Shinichi Yokoyama; Ryoichi Yoshida; Yousuke Maekawa, and Yuji Yoshida, all of Sapporo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 25, 1977, Ser. No. 762,286

Claims priority, application Japan, Jan. 28, 1976, 51/8982

Int. Cl.[2] B67B 7/00

U.S. Cl. 222—1 **2 Claims**

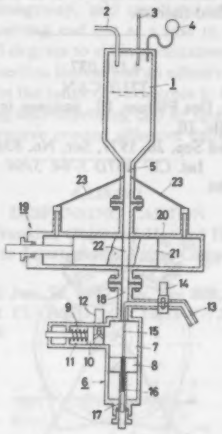
1. A method for discharging a high-pressure gas-occluding liquid from a pressureproof container holding therein said liquid in a compressed state into an outer space under normal pressure, which method comprises:

(1) connecting said pressureproof container holding therein the high-pressure gas-occluding liquid in a compressed state through the medium of a valve with a pressureproof receptacle (a) disposed below said pressureproof container, (b) having a piston disposed inside said pressureproof receptacle and provided with a shaft extending downwardly from the lower side of said piston and with a slender cylinder of unfilled space opening in the upper side of said piston and extending axially in said shaft, (c) having a liquid discharging pipe disposed in said pressureproof receptacle via a valve, one end of said pipe being inserted into the cylindrical space in said piston and (d) having a free piston disposed in the upper section of said pressureproof receptacle via a valve and adapted so as to have its movement limited by means of a spring;

(2) adjusting the internal pressure of said pressureproof receptacle to a magnitude slightly lower than the pressure within said pressureproof container by allowing the piston disposed inside said pressureproof receptacle to move upwardly;

(3) opening the intervening valve and at the same time allowing the piston disposed inside said pressureproof receptacle to move gradually downwardly for thereby allowing the high-pressure gas-occluding liquid to transfer from said pressureproof container to the pressureproof receptacle,

(4) closing said intervening valve while leaving unfilled space within said pressureproof receptacle;



(5) allowing the piston disposed inside said pressureproof receptacle to further move downwardly and at the same time opening a valve adjacent to said free piston for thereby lowering the internal pressure of said pressureproof receptacle and consequently separating the gas from the liquid; and

(6) opening the valve of said liquid discharging pipe and at the same time allowing the piston disposed inside said pressureproof receptacle to move upwardly for thereby releasing the liquid alone into an outer space under normal pressure.

4,138,036

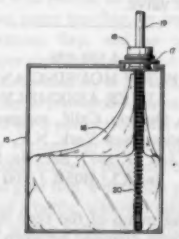
HELICAL COIL TUBE-FORM INSERT FOR FLEXIBLE BAGS

Curtis J. Bond, Marion, Ohio, assignor to Liqui-Box Corporation, Worthington, Ohio

Filed Aug. 29, 1977, Ser. No. 828,632

Int. Cl.[2] B65D 35/56

U.S. Cl. 222—105 **4 Claims**



1. In combination with a flexible bag having a dispensing spout with an opening through which the bag contents may be removed, means for facilitating removal of the bag contents by a pressure-differential on the bag, said means comprising a

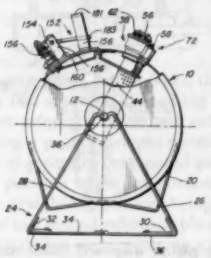
helical coil having one end leading into the spout opening and the other end extending into the bag so that as the contents of the bag are removed, an outlet tube can form there-around by the progressively collapsing wall of the bag, said coil being a formed helix which is resiliently flexible to permit bending along its length and which has its one end disposed concentric with the spout, an adapter device removably mounted on the spout and having an inwardly extending tube connection for receiving said end of said helix for mounting, it concentrically on the spout and also having an outwardly extending tube connection for receiving an outlet tube said adapter device having a double skirt which slips over an exposed edge of the spout and is locked thereto.

4,138,037

TILT CAN

William J. Zehr, Des Plaines, Ill., assignor to The Protectoseal Co., Bensenville, Ill.

Filed Sep. 26, 1977, Ser. No. 836,471
Int. Cl.[2] B67D *5/64, 5/04*
U.S. Cl. 222—166 **6 Claims**



1. A tilt fill can assembly for flammable liquid having automatic venting when pouring spout is opened comprising:

a can having side walls and a cylindrical wall between,

(1) said side walls having pivot rods extending outwardly of the can side walls offset from the horizontal axis of the can and in the vertical axis thereof, and supporting legs therefor;

(2) a pair of spaced triangularly shaped frames, the apex being bent inwardly to form a seat for said rods;

(3) a carrying handle for said can mounted thereon;

(4) a pouring spout positioned on said can offset from said handle;

(5) a filler spout assembly on said can offset from said handle and on the side opposite that of the pouring spout;

(6) a vent valve assembly on said can adjacent said filler spout;

(7) a second handle for opening said pouring spout with a portion seated interiorly of said carrying handle; and

(8) elongated pivoted lever means interior of said can operable when said pouring spout is opened to automatically open said vent valve.

4,138,038

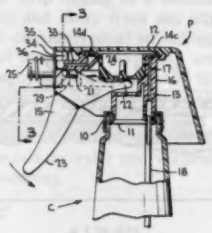
DISPENSING PUMP HOUSING AND OPERATING LEVER ASSEMBLY

Richard P. Grogan, Ontario, Calif., assignor to Diamond International Corporation, New York, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,864
Int. Cl.[2] B05B *11/00*
U.S. Cl. 222—207 **3 Claims**

1. In a dispensing pump of the type in which a resiliently deformable diaphragm clamped between opposing upper and lower pump housing members of the pump housing cooperates with said upper member to define a variable volume pump chamber in which inlet and outlet passages formed in said pump housing define a discharge path for liquid from a supply container through said pump chamber to a discharge nozzle, said diaphragm including an endless resiliently deformable marginal flange clamped in fluid tight manner between said housing members and encircling said pump chamber, said flange including flap valves constituting unitary portions thereof and extending across and normally closing the respective inlet and outlet passages, and an operating lever pivotably mounted on said lower housing member and having a portion movable into operative drformable engagement with said diaphragm to vary the volume of said pump chamber;

the improvement wherein said lower member has a pair of spaced side walls and a discharge nozzle, a lever support



comprising L-shaped brackets being provided on said walls and opening into a bottom side of said lower member so as to be accessible from said bottom side;

said lever having a trunnion thereon in engagement with said brackets, said trunnion being movable during assembly into engagement with said brackets from said bottom side of said lower member; and

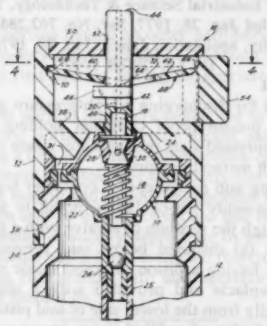
said upper housing member having at least one depending leg member disposed along an open side of said brackets and bearing against said trunnion for maintaining it seated on said brackets.

4,138,039

PUMP ACTUATING SYSTEM

Lewis A. Micallef, Fort Lee, N.J., assignor to Leeds and Micallef, Fort Lee, N.J.

Filed Oct. 4, 1976, Ser. No. 728,930
Int. Cl.[2] B05B *11/02*
U.S. Cl. 222—321 **19 Claims**



1. A pump actuating system for a container having a pump for dispensing the container contents, the pump being a reciprocating pump having a vertically reciprocating plunger having a discharge outlet, the system comprising:

a housing, the housing being a cap having means for coupling with the neck of a container;

conduit means at the outlet of the pump to direct the contents of the container away from the pump, the conduit means including a separate nozzle coupled with the outlet

of the pump for directing the container contents in a preselected dispensing pattern;

an acuator means mounted by the housing for actuating the pump from a first pump position at which the container contents are in the pump chamber to a second pump position at which the contents are expelled from the pump chamber and then back to the first pump position at which the contents are drawn into the pump chamber;

the actuator means being shiftable in a direction transverse of the conduit means from a first actuator position at which the pump is at the first pump position to a second actuator position at which the pump is actuated to the second pump position and then back to the first actuator position at which the pump is returned to the first pump position, the transverse direction along which the actuator means is shiftable being substantially horizontal, and the actuator means translating its horizontal movement into vertical reciprocation of the conduit means and consequently actuation of the pump; and

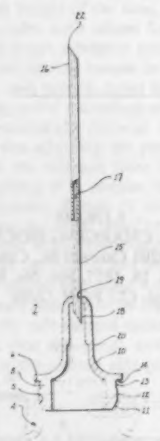
the actuator means comprising a single transverse force applying member coupled with the plunger in a manner whereby friction forces are minimal and the forces applied will produce minimum torque during shifting of the actuator means and reciprocation of the plunger.

4,138,040

DISPENSER FOR ANAEROBIC AND CYANOACRYLATE ADHESIVES

Hugh J. Stock, Saratoga, Calif., assignor to Pacer Industries, Inc., Campbell, Calif.

Filed Apr. 12, 1976, Ser. No. 676,229
Int. Cl.[2] B65D *47/18*
U.S. Cl. 222—420 **4 Claims**



1. An applicator for dispensing anaerobic and cyanoacrylate adhesives in minute and precise quantities from a container to a point of application, said applicator comprising in combination:

(a) a neck defining the opening to said container, said neck including: a circular inner surface comprising a radially expanded annular depression and a radially inwardly extending annular shoulder disposed at each side of said annular depression;

(b) a hollow base for sealingly engaging said neck, said base including:

i. a nipple section having a passageway circular in cross-section extending through the upper extremity thereof; and

ii. a hollow lower part of plastic material having a skirt for mating with said circular surface of said neck, said skirt of said lower part including a radially expanded annular band disposed intermediate a radially inwardly sloping annular beveled surface and a radially inwardly extending annular depression for lockingly mating with corresponding mirror image elements developed within said circular inner surface of said neck;

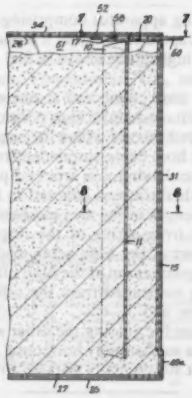
(c) a flexible capillary tube of Teflon plastic material of grade TFE penetratingly mounted within said passageway for conveying the adhesive from within said hollow lower part to the point of application, said capillary tube being of a diameter greater than the diameter of said passageway whereby said capillary tube must be force fit into said passageway, said capillary tube including an adhesive receiving end cut at a bias in the range of 55 degrees to 65 degrees to aid in penetration of said passageway upon insertion therein and an adhesive dispensing end cut at a bias in the range of 55 degrees to 65 degrees to aid in unclogging said dispensing end by flexing said dispensing end to remove crusted adhesive therefrom.

4,138,041

DISPENSING CARTON

James L. Capo, Franklin, Ohio, and Howard D. Zint, Florence, Ky., assignors to International Paper Company, New York, N.Y.

Filed Jun. 23, 1977, Ser. No. 809,358
Int. Cl.[2] B65D *5/76*; G01F *11/28*
U.S. Cl. 222—456 **4 Claims**



1. A dispensing carton having a measuring chamber therewithin and a reclosable discharge opening therefor, which is formed from a single-piece paperboard blank and comprises:

(a) a substantially rectangular container portion defined by a first series of hingedly connected members, including side wall panels, end wall panels, an inner top flap, an intermediate top flap, an outer top flap, an inner bottom flap, an intermediate bottom flap, and an outer bottom flap, wherein said inner top flap is provided with a lower opening tab which is defined by a perforated score line, and said outer top flap is provided with an upper opening tab which is defined by a perforated score line;

(b) a substantially rectangular measuring chamber portion defined by a second series of hingedly connected members including an end glue flap, a partition panel, an intermediate glue flap, and a baffle, wherein said baffle is provided at its upper end with a baffle flap which is hingedly connected thereto; and

(c) a rectangular discharge opening assembly which, when said dispensing carton is erected, is comprised of (i) portions of said outer top flap, which are positioned to overlap portions of said inner top flap; (ii) said baffle flap; and

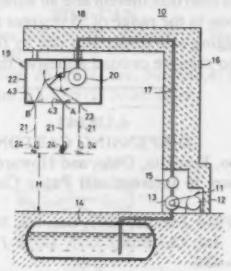
(iii) a tapered slide valve member, which is disposed between said inner top flap and said baffle flap.

4,138,042

FUEL SUPPLYING APPARATUS HAVING A LINEARLY MOVABLE, CONSTANT HEIGHT HOSE UNIT

Kenji Okada, Tokyo, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Dec. 16, 1977, Ser. No. 861,501
Claims priority, application Japan, Dec. 18, 1976, 51-152364; Jun. 23, 1977, 52-74833
Int. Cl.[2] B67D *5/12*
U.S. Cl. 222—529 **11 Claims**



1. A fuel supplying apparatus comprising:
- a conduit pipe adapted to conduct a liquid fuel from a storage tank to a high place above a fuel supplying service area;
- a fuel supplying hose connected at one end thereof to the conduit pipe at its end at the high position and provided at the other free end thereof with a fuel supplying nozzle, the free end of the hose being suspended from the high place;
- an arm mechanism having one arm end pivoted at the high place and another arm end adapted to move in a straight line, the total length of the arm mechanism being substantially constant irrespective of the displacement position thereof, one part of the hose being disposed substantially along the arm mechanism at the high place, the free end of the hose being suspended from the other arm end of the arm mechanism; and
- a guide mechanism for guiding the other arm end of the arm mechanism in a substantially horizontal movement, that is, in a movement substantially parallel to the service area.

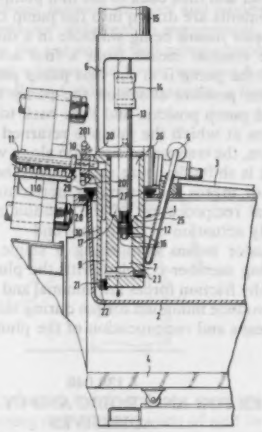
4,138,043

DIE CASTING MACHINE WITH SCREW PLUGS IN PASSAGES

Wolfgang Frech, Schorndorf-Weiler, Fed. Rep. of Germany, assignor to Firma Oskar Frech Werkzeugbau, Fed. Rep. of Germany

Filed Jan. 5, 1977, Ser. No. 756,980
Int. Cl.[2] B22D *17/02, 39/00*
U.S. Cl. 222—596 **22 Claims**

1. A gooseneck for a hot chamber die casting machine, the gooseneck comprising:
- a compression chamber means,
- a pressure piston means displaceably mounted in said compression chamber means,
- an injection nozzle means for injecting a melt from the gooseneck,
- means for communicating the compression chamber means with said injection nozzle means including a first passage cast as a through-passage, said passage and said compression chamber means having a cross-sectional form of two cylinders having parallel axes,
- a plug means threadably inserted into said first passage for closing an end of said passage opposite said nozzle means,
- a cutting means arranged on said plug means so as to face said first passage when said plug means is inserted into said first passage, said cutting means including a cutting edge which penetrates into the gooseneck upon threadably inserting the same into said first passage, said cutting edge is annular and concentric to a longitudinal axis of said plug



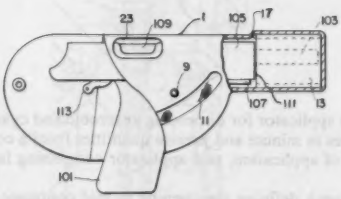
means and has a triangular cross-sectional configuration as taken along the longitudinal axis of said plug means, and means for mounting said nozzle means at the gooseneck including a projecting neck portion extending radially outwardly from the gooseneck.

4,138,044

PISTOL CHARGING HOLSTER

Daniel D. Musgrave, 8201 Carawat St., Cabin John, Md. 20731

Filed Oct. 18, 1977, Ser. No. 843,231
Int. Cl.[2] F41B *13/04*
U.S. Cl. 224—2 B **8 Claims**



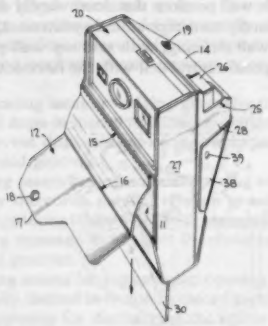
1. A charging holster for a pistol charged by a first and a second movement of a frame relative to a slide, comprising: a sheath arranged for suspension from the person of a user, said sheath being adapted for insertion of said pistol completely therein in a first orientation without causing said first or said second movement; and said sheath also being adapted for insertion of said pistol therein in a second orientation whereat rigid abutment means fixed in said sheath can engage said slide at the front of the pistol to accomplish said first movement during said insertion.

4,138,045

CAMERA CASE

Robert A. Baker, Dandridge, Tenn., assignor to Engineered Products, Inc., Dandridge, Tenn.

Filed Jun. 15, 1977, Ser. No. 806,867
Int. Cl.[2] A45C *11/38*
U.S. Cl. 224—5 V **2 Claims**



1. A camera case formed of a flexible material, for use with a camera of the instant type, whereby a photograph is released from the body of the camera within seconds after the taking of a picture, comprising: a unitary sheet folded to define a front panel, a back panel and a pair of side panels, said front, back and side panels being folded and secured to form a receptacle corresponding in size to a camera for receiving the same, a top panel attached to the front panel across the width of the case about midway of the height of the case, said top panel having a flap which is provided with means for releasably fastening said flap to the back panel, a bottom panel secured at one end to the back panel and having means on the opposite end for releasably fastening said bottom panel to the front panel, said bottom panel having a slot extending substantially across the width thereof approximately midway of the length of said bottom panel, said slot allowing the passage therethrough of photographs which are released from the lower end of the camera upon the taking of a picture, said back panel being provided with an opening therein to receive the camera eyepiece, said back panel and front panel being connected on one side through a first one of said side panels, and the second side panel extending from the side of said front panel opposite the first side panel, said second side panel having a flap on the side thereof opposite to said front panel, at least one flap attached to said back panel on the side thereof opposite to the side which is connected to said first side panel, and means for releasably fastening said flap of the second side panel to the flap of the back panel.

4,138,046

DEMOUNTABLE TRUCK BED LOAD-SUPPORTING RACK

William E. De Freze, 7530 Ironwood Dr., Dublin, Calif. 94566

Continuation-in-part of Ser. No. 565,274, Apr. 4, 1975, abandoned. This application Jan. 13, 1977, Ser. No. 759,137
Int. Cl.[2] B60R *9/06*
U.S. Cl. 224—42.42 R **3 Claims**

1. A load-supporting rack for a truck bed comprising:

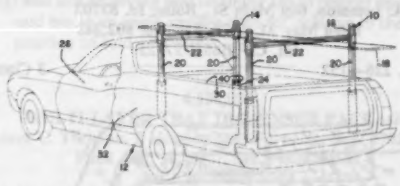
a plurality of similar base members attached for mounting adjacent the fore and aft corners of a truck bed and each having a vertically elongated cylindrical opening extending to the upper end thereof;

a plurality of similar elongated cylindrical tubular members dimensioned for slidable mounting in upright position, one on each of said openings;

a pair of collars fixed in similarly longitudinally spaced relation on and surrounding each of said upright members, one of said collars being spaced from one end of each of said upright members and engageable with one of said base members to provide load-bearing support for said upright members, the other of said collars being similarly spaced from the opposite end of each of said upright members;

a plurality of similar individually separate cylindrical tubular horizontal members;

parallel sleeves afixed to the opposite ends of each of said horizontal members and providing parallel cylindrical



openings dimensioned for slidably receiving said other ends of a transversely related pair of upright members, said sleeves being dimensioned to bear on the other of said collars with the latter providing load-bearing support therefor; and

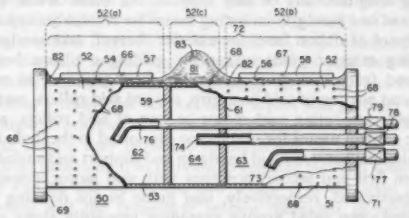
said upright and horizontal members when disassembled providing compact stowage in a bundle of essentially elongated elements with all of said members disposed in substantially parallel relations.

4,138,047

FLUID BEARING

Charles J. Sherman, Frenchtown, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,512
Int. Cl.[2] B65H *17/32, 23/24*
U.S. Cl. 226—7 **11 Claims**



6. A fluid bearing for independently supporting a plurality of articles, which comprises:

(a) a housing for containing a fluid within its interior, said housing having an outer surface for cooperating with a surface of each article of the plurality of articles;

(b) a guide means provided on said outer surface, defining with said outer surface a support channel, for maintaining the plurality of articles within the boundaries of said defined support channel; and

(c) means for passing said fluid from said interior of said housing through said outer surface, within said channel, to form a fluid layer thereover having a fluid spike therein for each adjoining article of the plurality of articles, said fluid layer supporting independently of one another each said adjoining article and said fluid spike separating from one another each adjoining article.

11. A method of independently supporting a plurality of articles, which comprises:

maintaining a plurality of articles traveling across a surface of a support channel within said channel;

introducing a supply of pressurized fluid at a first pressure through said surface, to form a fluid layer between the surface and each article of the plurality of articles to support each article; and

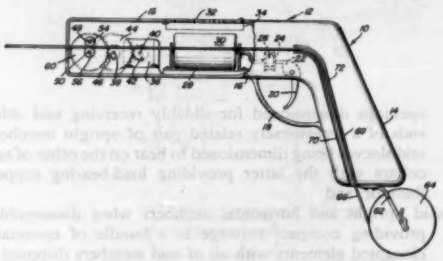
introducing a supply of pressurized fluid at a second pressure, higher than said first pressure, through at least one area of said surface to form at least one fluid spike in said fluid layer for each pair of adjacent supported articles to separate each supported article of said plurality of supported articles from its adjacent supported article.

4,138,048

MOTORIZED TINSEL DECORATING TOOL

James A. Lemmon, 609 Main St., Boise, Id. 83702

Filed May 31, 1977, Ser. No. 802,243
Int. Cl.² B65H *17/22*
U.S. Cl. 226—152 **3 Claims**



1. A motorized flexible ribbon dispensing tool, said tool including a hollow body defining an elongated inclined handgrip and an elongated support projecting, horizontally, angularly outwardly and forwardly of the upper end portion of said handgrip, a motor housed within said support, a pair of generally parallel peripherally engaged side-by-side drive rollers journaled from the forward end portion of said support remote from said handgrip for rotation about axes extending transversely thereof and disposed on opposite sides of a plane extending longitudinally of said support, the other lower end portion of said handgrip including means for rotatably supporting a spool of ribbon from the exterior thereof, said handgrip including exterior guide means for guiding a ribbon being unwound from said spool along said handgrip and, at said upper end portion of said handgrip, toward said rollers, means drivingly connecting said motor to one of said rollers, and trigger control means for said motor supported in the included angle defined between said handgrip and support and shiftable between first and second positions with said motor actuated and deactivated, respectively, said guide means defining an elongated open sided groove extending upwardly along one side of said handgrip and curving forwardly toward the forward free end of said support at the upper end of said handgrip, said rollers being supported outwardly of the side of said support corresponding to said one side of said handgrip and including exposed outer ends facing outwardly of the corresponding side of said support between which a length of ribbon may be laterally inserted, said motor comprising an electric motor and said hollow body housing a storage battery therewithin electrically connected to said motor for actuation thereof by means of electric circuit means having a selectively openable and closeable switch serially connected therein, said trigger control means being operatively associated with said switch for control thereof, said tool being free of ribbon engaging guide structure forward of said rollers.

4,138,049

DUAL FUNCTION SEALING GASKET

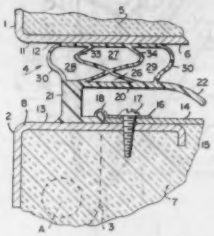
Fred R. McAlarney, Seymour, Ind., assignor to The Pantasote Company, Greenwich, Conn.

Filed Oct. 29, 1976, Ser. No. 737,149
Int. Cl.² F16J *15/02*; E06B *7/16*
U.S. Cl. 277—80 **5 Claims**

1. A hollow flexible sealing gasket having a uniform cross-section throughout its length, said gasket being formed of plastic material and comprising in its normal unstressed condition a relatively stiff base member;

an outer cell wall extending upwardly from said base member and having spaced side wall portions and a top wall portion;

an inner upper central cell wall extending downwardly from said top wall portion, said inner central wall having a pair of spaced side wall portions that downwardly diverge and then downwardly converge until they intersect, said inner central cell wall defining, with said top wall portion, an upper pentagonal central cell with the intersection of said



wall portions being the lowest part of the pentagon, said top wall portion being substantially flat between said side wall portions of said inner central cell wall; and

two downwardly diverging, inner divider cell walls extending from said intersection of said side wall portions to said base member, said inner divider cell walls defining an inner central lower triangular cell;

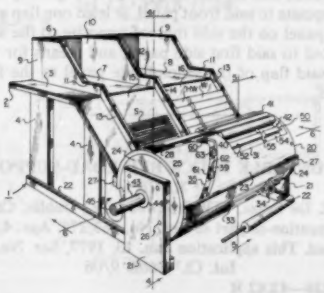
all of said cell walls being flexible and substantially more flexible than said base member, said cell walls defining said upper pentagonal central cell, said lower triangular central cell and a pair of side cells on either side of said central cells.

4,138,050

WIENER STICK APPLICATOR

David E. McKinney, Rte. 2, Box 43A 1, and Donald E. Phillips, Rte. 2, Box 129A, both of Daingerfield, Tex. 75638

Filed Nov. 16, 1977, Ser. No. 851,828
Int. Cl.² B27F *7/00*
U.S. Cl. 227—117 **10 Claims**



1. An apparatus for inserting relatively slender handle sticks in elongate edible articles, such as axially aligned wieners/half wieners, including

a drum having a cylindrical exterior and a generally horizontal axis about which it is rotatable,

upright means for rotatably supporting the drum,

a multiplicity of parallel spaced grooves extending longitudinally of the cylindrical exterior of said drum,

one end portion of each groove being relatively narrow to

provide a channel for receiving and supporting a relatively slender handle stick,

the other end portion of each groove being relatively wide to provide an elongate pocket for receiving and supporting an elongated edible article of relatively large diameter in axial alignment with the stick in the channel half of said groove,

the relatively narrow channel of each drum groove being of greater length than each stick,

means for simultaneously feeding axially aligned sticks and edible articles consecutively and respectively to said channels and pockets of said grooves upon rotation of said drum,

coaxial casing means overlying generally the upper one half of said drum in spaced relationship and coacting therewith to prevent displacement of the sticks and edible articles from said grooves,

the casing means having an inlet opening extending longitudinally thereof in parallel relation to said drum grooves for registering therewith and communicating with the feeding means so as to admit the sticks and edible articles to said grooves,

said casing means having an outlet opening extending longitudinally thereof in remotely spaced parallel relation to its inlet opening for discharging the edible articles impaled on the sticks,

pusher means mounted on said casing means in overlying relatively close proximity to each drum channel and having spline means slidably confined in the outer end portion of said channel for reciprocal movement toward and away from the stick therein, and

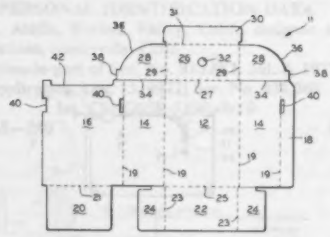
cam means extending circumferentially of said casing means in overlying relation to said channel outer end portions and having each pusher means in movable contact therewith for imparting inward and outward reciprocation to said pusher means relative to said channel upon rotation of said drum so as to engage and force the stick to penetrate the edible article in axial alignment therewith and then withdraw said pusher means to said outer end portion of said channel.

4,138,051

DISPENSER BIN CONTAINER

James A. Zicko, Natick, Mass., assignor to Container Corporation of America, Chicago, Ill.

Filed Dec. 30, 1977, Ser. No. 865,996
Int. Cl.[2] B65D 5/72
U.S. Cl. 229—17 B **3 Claims**



1. A reusable dispenser bin container formed from a cut and scored blank of paperboard, comprising:

(a) foldably interconnected top, side, and bottom major walls forming a tubular structure;

(b) end walls formed from end wall forming panels hingedly attached to end edges of certain of said major walls;

(c) one end wall of said container comprising a dispenser bin formed from one of said end wall forming panels and a pair of bin side panels foldably joined to opposite edges of said end wall forming panel along parallel hinge lines;

(d) said side panels being generally pie shaped and each being defined by one of said hinge lines, a free inner edge extending normal to said one hinge line and a free outer edge extending between said one hinge line and said inner edge;

(e) a retaining tab projecting from said outer edge and being located adjacent a corner formed by said inner edge and said outer edge;

(f) a slot formed in at least one of said major walls adjacent a fold line adjoining said top major wall with one of said side major walls;

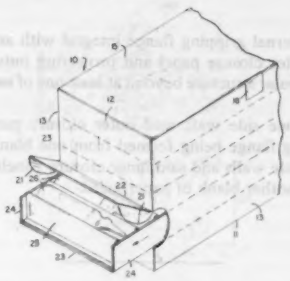
(g) said slot receiving said retaining tab to restrict opening of said bin to an angle smaller than 90° relative to the closed position of said end wall.

4,138,052

MULTI-LAYER TRAY DISPENSER PACKAGE

Puzant C. Torigian, 2 Horizon Rd., Fort Lee, N.J. 07024

Filed Aug. 22, 1977, Ser. No. 826,532
Int. Cl.[2] B65D 5/72
U.S. Cl. 229—17 B **7 Claims**



1. A multi-layer tray dispenser package for fragile containers of pharmaceutical preparations which comprises an enclosure box having a depth sufficient to receive a plurality of vertically superimposed trays for such containers, a plurality of trays thus disposed in said box, an end panel of said box having vertically spaced lines of weakening above the box bottom defining a transverse section there across and partway of the contiguous portions of the box side panels, whereby said transverse section may be raised to horizontal or higher position without detaching it to provide an opening through which that tray can be slid out of the box which is at the level of the opening and the transverse section thereafter re-positioned flush with the end panel, there being a subjacent non-slidable tray having an inturned flat member along one side on which the tray thereabove to be slid out can slide and the tray to be slid out having upstanding vertical integral members along each side to facilitate sliding action of the tray, the subjacent tray being the lowermost tray and being blocked against sliding movement, each of the trays being dimensioned to be substantially equal in size to the length and width of the box and each tray being provided with a corrugated-like member resting on the tray bottom with the corrugations extending transversely of the tray to form recesses for the reception of a series of the fragile containers out of contact with one another.

4,138,053

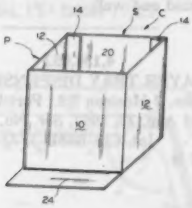
BULK CONTAINER WITH HANDLING FLANGE

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Feb. 6, 1978, Ser. No. 875,452
Int. Cl.[2] B65D 5/72, 13/04
U.S. Cl. 229—23 R **1 Claim**

1. A bulk bin type container formed from a pair of paperboard blanks and having an integral, external flange, said container comprising:

(a) a body including a plurality of vertical side walls foldably interconnected at the corners to form a tubular structure;
(b) closure means for the lower end of said tubular structure, including:
(i) an outer closure panel integral with and hinged to a lower edge of one of said side walls;
(ii) inner closure panels foldably joined to lower edges of other of said side walls and folded inwardly and normal thereto and secured to said outer closure panel in overlying relation therewith;

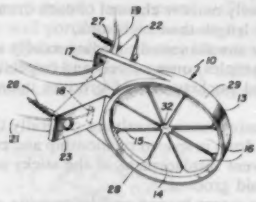


(c) an external gripping flange integral with and hinged to said outer closure panel and projecting outwardly from said tubular structure beyond at least one of said other side walls;
(d) said one side wall, said outer closure panel and said gripping flange being formed from one blank while said other side walls and said inner closure panels are formed from another blank of paperboard.

4,138,054
CONTAINER FORMED FROM BAGS HAVING INSERTS
Neil E. Spencer, 524 W. Maple St., North Canton, Ohio 44720
Filed Dec. 27, 1977, Ser. No. 865,232
Int. Cl.[2] B65D *5/32*
U.S. Cl. 229—23 BT **10 Claims**

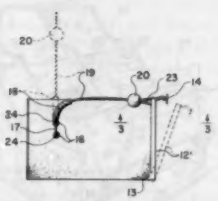
1. A container, comprising:
a flat-bottom bag of flexible material and oblong in cross-section, and an insert formed from planar relatively rigid material, said insert having elongated sides terminating in marginal edges defining a width substantially equal to the width of two opposite walls of said bag,
said insert being folded to U-shape to provide a relatively flat bight and legs extending in substantially equal amounts from opposite ends of said bight, to define three flat panels between said marginal edges,
said insert being disposed within said bag to a position wherein said bight overlies the inside surface of the bottom of said bag, and said leg panels lie along the inside surfaces of respective ones of said opposite bag walls, the remaining two opposite walls of said bag being substantially free of contact with said insert, thereby to reinforce said two opposite walls and the bottom of said bag.

4,138,055
PERIODICAL HOLDER
Howard M. Harrison, 5 Teaticket Park, Teaticket, Mass. 02536
Filed Sep. 1, 1977, Ser. No. 829,647
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—1 C **3 Claims**



1. Periodical holder, comprising:
(a) a base provided with two spaced apertures adapted to receive straps for mounting on a post-like support,
(b) a circular ring extending laterally from the base, the base being in the form of a flange extending from the ring and being thinner than the ring, the flange being bounded by two opposite straight edges extending tangentially from the outer periphery of the ring and being joined by a third striaght edge which is spaced from the ring,
(c) abutments that extend laterally of the plane on the ring in opposite directions, each abutment being provided with an aperture adapted to receive a screw to fasten the holder to a support, and
(d) a circular diaphragm connected at its outer periphery to the inner surface of the ring, the diaphragm being formed of a flexible material having a central circular aperture, a plurality of semi-circular apertures formed around the periphery of the diaphragm with their circular edges facing inwardly, and a plurality of cuts extending from the circular aperture, there being one cut to each semi-circular aperture to divide the diaphragm into a series of angular fingers, the base, ring, and diaphragm being integrally formed of an elastomer plastic.

4,138,056
MAILBOX SIGNAL
James T. Sherrill, Rte. 3, Box 635, Fayetteville, N.C. 27406
Filed Nov. 25, 1977, Ser. No. 854,541
Int. Cl.[2] D65D *91/00*
U.S. Cl. 232—35 **5 Claims**



1. A signal for attachment to a rural type mailbox to signal when the door of the box has been opened comprising: a signal constructed from a single wire-like piece of material and including means for securing one end of said signal to the side of said mailbox in a generally vertical position; a coil type spring formed adjacent said end of said signal secured to said box; an elongated portion disposed from said spring portion from the end thereof opposite said end secured to said box; an enlarged, generally spherically shaped indicator mounted on said elongated portion adjacent the end thereof opposite said coil spring portion; and a tip end of said signal on the side of said enlarged indicator opposite said elongated portion in the form of a pair of obtuse angle bends in said wire-like material terminating in

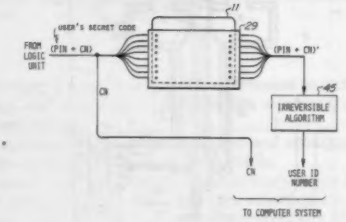
a tip portion whose longitudinal axis is generally parallel to the longitudinal axis of said elongated portion, said tip portion being adapted to be releasably retained between said door and said box when said door is closed and said signal is bent to a generally horizontal position whereby said tip portion will be released when said door is opened thereby allowing said signal to biasly spring upright to give an indication of mail delivery.

4,138,057

CARD, SYSTEM AND METHOD FOR SECURING USER IDENTIFICATION DATA

Martin M. Atalla, Portola Valley, Calif., assignor to Atalla Technovations, Sunnyvale, Calif.

Filed Jul. 8, 1977, Ser. No. 813,882
Int. Cl.[2] G06K *5/00, 7/10, 19/06*
U.S. Cl. 235—380 **2 Claims**



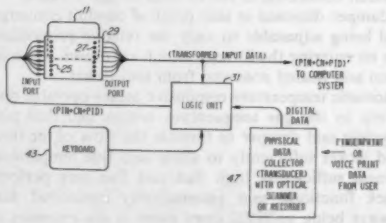
1. A system for securing entered user-identification data utilizing a card having signal channels arranged in a selected pattern for transforming entered data, the system comprising:
keyboard means for entering the user-identification data;
logic means coupled to the keyboard means for receiving the entered user-identification data and for producing input data including selected data and the user- identification data;
card reader means coupled to the logic means for receiving said card, and responsive to said input data for applying input signals to the card and receiving output signals from the card including the transformed user-identification data; and
an irreversible algorithm unit for receiving the transformed data and producing therefrom irreversible encrypted data.

4,138,058

CARD, SYSTEM AND METHOD FOR SECURING PERSONAL IDENTIFICATION DATA

Martin M. Atalla, Portola Valley, Calif., assignor to Atalla Technovations, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 813,882, Jul. 8, 1977. This application Aug. 15, 1977, Ser. No. 824,260
Int. Cl.[2] G06K *5/00, 7/10*
U.S. Cl. 235—380 **8 Claims**



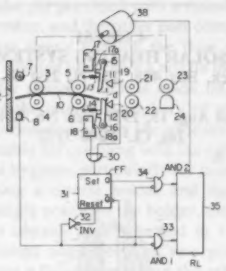
1. A system for securing entered user-identification data utilizing a card having signal channels arranged in a selected pattern for transforming entered data, the system comprising:
data entry means for entering user-identification data;
logic means coupled to the data entry means for storing the entered user-identification data and for producing input data including selected data and the user-identification data; and
card reader means coupled to the logic means for receiving said card, and responsive to said input data for applying input signals to the card and receiving output signals from the card representing transformed user-identification data.

4,138,059

CARD HANDLING DEVICE

Takeshi Endoh, Tama, and Mitsuru Takayasu, Kawasaki, both of Japan, assignors to Fujitsu Limited, Japan

Filed Dec. 10, 1975, Ser. No. 639,217
Claims priority, application Japan, Dec. 13, 1974, 49-143955
Int. Cl.[2] G06K *13/06;* **E05B** *65/00;* **G07F** *1/06;* **G06K** *13/08*
U.S. Cl. 235—483 **8 Claims**



1. An information bearing card handling device comprising in combination:
means providing an aperture for inserting an information bearing card therethrough;
a card reader for reading said information on said inserted card;
means for transporting said inserted card from said aperture toward said reader;
means provided between said aperture and said reader for detecting deformations in said inserted card beyond a predetermined limit and effecting automatic rejection of said inserted card by generating an output signal when said deformations are detected; and
means responsive to said output signal for automatically controlling said transporting means so as to transport said deformed card back through said aperture.

4,138,060

AUTOMATIC DRAFT CONTROL

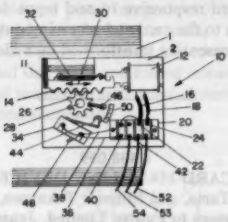
Alfonso Iacono, 68 Lake St., Brooklyn, N.Y. 11223

Filed Apr. 26, 1977, Ser. No. 790,868
Int. Cl.[2] F23L *3/00*
U.S. Cl. 236—1 G **6 Claims**

1. A furnace flue gases control device for regulating the damper vane in a flue pipe comprising;
a flue pipe section having a damper vane therein;
a shaft for rotating said damper vane, said shaft extending at least through one side of said flue pipe section;
a pinion gear affixed to the shaft end extending through said side of said flue pipe section;
a toothed rack engaging said pinion for rotating said damper vane to an open position;
a solenoid for reciprocating said toothed gear rack;

a return spring for returning said damper vane to a closed position;

a switch means for controlling a furnace burner circuit; and



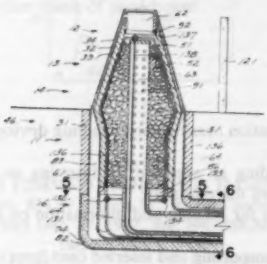
a lever on said pinion gear for switching said switch means, wherein said solenoid and said switch are adjustable to change the open and closed positions of said damper vane.

4,138,061

SOLAR HEATING SYSTEM

Harold C. Besack, Box 458, 221 N. 21st St., Beatrice, Nebr. 68310

Filed Aug. 15, 1977, Ser. No. 824,881
Int. Cl.[2] F24J *3/02*
U.S. Cl. 237—1 A **6 Claims**



1. A solar heating system comprising:

(a) a radiant heat collector means for heat absorption and radiation wherein said collector means includes a plurality of upwardly and outwardly exposed light admitting surfaces with said surfaces being collectively omni-directionally exposed above ground level and having a plurality of heat absorption surfaces disposed proximate the light admitting surfaces substantially parallel to said light admitting surfaces whereby a fluid passageway is defined between said surfaces;

(b) a reflector means for directing radiant energy upon at least one of the light admitting surfaces of said collector means, said reflector means further comprising a solar heat reflecting material affixed to a substantially vertical panel;

(c) heat storage means for retaining heat energy having a thermally isolated base unit disposed beneath the collector means, said base unit defining a vessel and said vessel containing a heat retaining medium and having a plurality of pneumatic pathways through said medium; and

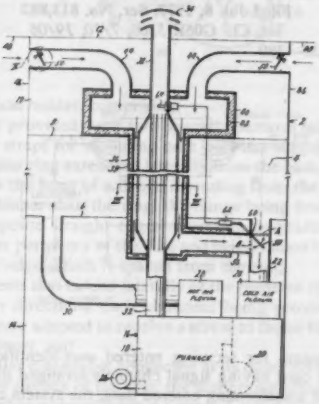
(d) ducting means for providing fluid communication between the collector means and the heat storage means, said ducting means adapted to be connected to a building, said ducting means having a first duct defining a passageway between a building, said fluid passageway between the two surfaces included in said collector means and a second duct defining a passageway between said fluid passageway between the two surfaces of said collector means and the input pneumatic pathways through the heat retaining medium and a third duct defining a passageway between the output pneumatic pathway through the heat retaining medium in a building and a fourth duct defining a passageway between the input pneumatic passageways through the heat retaining medium and a building.

4,138,062

FURNACE AIR CIRCULATION SYSTEM

Lester E. Graden, 1218 Lawrence Ave., Leavenworth, Kans. 66048

Filed Jul. 5, 1977, Ser. No. 812,682
Int. Cl.[2] F24B *7/02, 7/04*
U.S. Cl. 237—55 **1 Claim**



1. In combination with a furnace including a blower operable to extract air from a zone to be heated and to return said air to said zone, and a fuel burner operable to heat said air as it passes through said furnace, said burner having a vertically extending flue pipe having stack functions including the disposal of the gaseous products of combustion of said burner and the maintenance of a draft on said burner, an air circulation system comprising:

a. an air jacket surrounding a substantial portion of the length of said flue pipe, and having air inlet and outlet openings adjacent the respectively opposite ends thereof,

b. first conduits interconnecting the inlet opening of said jacket with a source of air to be heated by said furnace,

c. a second conduit interconnecting the outlet opening of said jacket with the air inlet of said furnace, whereby said blower draws air into said furnace partially from said zone to be heated, and partially from said jacket, the air being drawn from said jacket being warmed by heat transferred thereto through the walls of said flue pipe, the furnace air intake from the zone to be heated, and said second conduit from the air outlet of said jacket, converging in a common conduit connected to the air inlet of said furnace,

d. a damper disposed at said point of conduit convergence and being adjustable to vary the relative proportions of the air entering the furnace which are drawn respectively from said heated zone and from said jacket,

e. automatic temperature-responsive means operable responsively to the gas temperature within said flue pipe to regulate said damper to throttle the flow of air through said jacket sufficiently to allow said flue temperature to remain sufficiently high that said flue may perform its stack functions, said automatically controlled damper always being partially open even at the extremes of its controlled movement, not completely disconnecting the furnace air intake either from the heated zone or from said jacket, and

f. a normally closed additional damper disposed in each of said first conduits and operable to open responsively to draft generated by actuation of said furnace blower, each

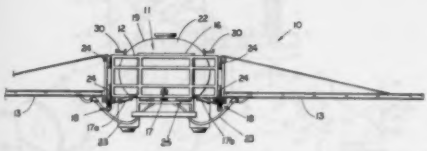
of said last-named additional dampers being equipped with means operable to adjust the degree of draft required to open said damper.

4,138,063

HYDRAULICALLY-OPERATED FERTILIZER AND CHEMICAL-SPREADING BOOM

John R. Batts, R.R. 2, Jamestown, Ind. 46147

Filed Mar. 25, 1977, Ser. No. 781,139
Int. Cl.² B05B *1/20*
U.S. Cl. 239—168 **3 Claims**



1. A spray boom apparatus for attachment to a chemical-dispensing vehicle having a cab with side windows, said apparatus comprising:

a stationary brace suitably designed and arranged for rigidly mounting to the rear of said vehicle;

a support rack attached to said stationary brace by means of a generally horizontal hinge pin arrangement;

a pair of chemical-dispensing booms vertically hinged to said support rack for movement of said booms relative to said support rack solely about a generally-vertical axis to and from an outwardly-projecting dispensing position;

means for moving said booms relative to said support rack solely about said generally-vertical axis to and from said dispensing position; and

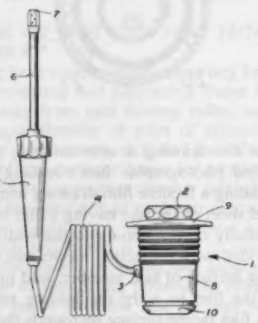
power cylinder means connected between said support rack and said stationary brace for pivoting said support rack downwardly and rearwardly solely about a generally-horizontal axis, said moving means and said pivoting means being operable to position said chemical-dispensing booms sufficiently above the side windows of the cab to allow entrance to and exit from the cab without interference by said chemical-dispensing booms.

4,138,064

RINSING DEVICE FOR PERSONAL HYGIENE

Michel Moret, Chene-Bourg, Switzerland, assignor to Les Produits Associes LPA S.A., Geneva, Switzerland

Division of Ser. No. 761,269, Jan. 21, 1977. This application Nov. 7, 1977, Ser. No. 849,301
Claims priority, application Switzerland, Jan. 21, 1976, 708/76
Int. Cl.² F16K *3/14*
U.S. Cl. 239—582 **3 Claims**



1. A nozzle assembly for coupling with the outlet of a rinsing device for personal hygiene, particularly for mouth washing, the assembly comprising a nozzle holder and means for interchangeably attaching a nozzle to the holder, the nozzle holder comprised of two coaxial parts screwed in relation to one another over a limited angle between two positions, one of which parts include a flow passage and the other including a closing member which cooperates with the flow passage in defining a shut-off valve and which in the one position blocks the flow passage and in the other position opens it, one of the two parts forming the nozzle holder including a cylindrical region at its outer periphery, a plurality of diametrically opposite grooves in the cylindrical region, each of which has a groove section inclined to the axis of the nozzle holder, which section at one end merges into another groove section extending at least approximately peripherally and orientated perpendicular to the axis of the nozzle holder, the other part of the nozzle holder comprising a number of projections corresponding to the number of grooves and being disposed therein, and one of the parts of the nozzle holder being an elongated hollow handle portion and comprising an internal pin situated inside the flow passage, the pin provided with a rounded head forming the closing member, and the other part comprising a bushing having an inner sleeve forming the flow passage of the shut-off valve and adapted to receive a nozzle tube of the spray nozzle and an outer sleeve which is made integral with the inner sleeve and at the internal periphery of which there are formed the projections disposed in the grooves.

3. A nozzle assembly for coupling with the outlet of a rinsing device for personal hygiene, particularly for mouth wasing, the assembly comprising a nozzle holder and means for interchangeably attaching a nozzle to the holder, the nozzle holder comprised of two coaxial parts screwed in relation to one another over a limited angle between two positions, one of which parts includes a flow passage and the other including a closing member which cooperates with this flow passage in defining a shut-off valve and which in the one position blocks the flow passage and in the other position opens it, one of the two parts forming the nozzle holder including a cylindrical region at its outer periphery, a plurality of diametrically opposite grooves in the cylindrical region, each of which has a groove section inclined to the axis of the nozzle holder, which section at one end merges into another groove section extending at least approximately peripherally and oriented perpendicular to the axis of the nozzle holder, the other part of the nozzle holder comprising a number of projections corresponding to the number of grooves and being disposed therein, and one of the parts of the nozzle holder being an elongated hollow handle portion, axial grooves being provided at the external periphery of the handle portion, said axial grooves having a smaller depth than the groove sections and branching off therefrom, said axial grooves extending as far as the front end of the handle portion, whereby in assembling the two parts of the nozzle assembly, one part can be pushed onto the handle portion with engagement of the projections in the axial grooves until said projections engage in said groove sections.

4,138,065

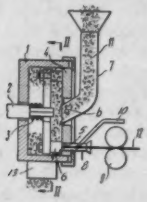
DEVICE FOR PREPARING FIBRE-FILLED POLYMERIC COMPOSITIONS

Yanis I. Buls, ulitsa Deglava, 17, kv. 7, Jurmala; Gunar E. Gailis, ulitsa Popova, 14, kv. 1, Riga; Sofia M. Borovikova, ulitsa Kravchenko, 4, korpus 1, kv. 21, Moscow; Evgeny V. Lurie, ulitsa Solnechnaya, 9, Moskovskaya oblast, stantsia Udelnaya, and Valery F. Mikhailov, Schelkovskoe shosse, 86, kv. 28, Moscow, all of U.S.S.R.

Filed Aug. 31, 1977, Ser. No. 829,345
Int. Cl.² B02C *23/28*
U.S. Cl. 241—55 **2 Claims**

1. An apparatus for preparing fibre-filled polymeric compositions, which comprises a chamber for blending the fibre with powdery or granular polymer to obtain a homogeneous polymeric composition; a fibre-chopping mechanism inside the

blender chamber comprising a stationary plate with a draw-nozzle having a sharpened lip and a rotary cutter adjacent to said plate so as to form with said plate a chopping zone for the fibre passed through the draw-nozzle; said rotary cutter, while



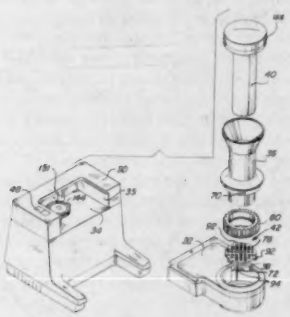
rotating, developing a vortex-like turbulent air flow for intermixing the chopped fibre with the polymer; an intake pipe communicating with the draw-nozzle for the fibre to feed through the draw-nozzle to the chopping zone and means for feeding a flow of polymer to the blending chamber.

4,138,066

FOOD GRINDER

Keith M. Mullins; Thomas K. Leppert; Thomas Cannon; Ronald R. Kerr, and Ronn G. Smith, all of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed May 2, 1977, Ser. No. 792,601
Int. Cl.[2] A47J *44/00*; B02C *18/30*
U.S. Cl. 241—86 **12 Claims**



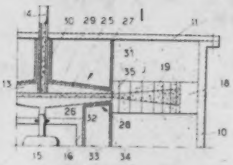
1. A food grinder comprising:
an upstanding base unit;
a motor mounted within said base unit;
delivery means, separate from said motor but coupled thereto, mounted within said base unit for transmitting motion from said motor;
means in said base unit defining a receptacle having a horizontally-facing opening, an output portion of said delivery means extending into said receptacle;
cassette means, including a food grinding mechanism, removably receivable within said opening of and into said receptacle for receiving motion from said delivery means to operate said mechanism only upon proper placement of said cassette means;
a portion of said cassette means including said mechanism projecting horizontally outward from said base unit, and a motion transmitting portion of said grinding mechanism projecting toward and into coupling relationship with said output portion of said delivery means, when said cassette means is mounted within said receptacle;
and said cassette means including a vertically-oriented stationary well with the food processing portions of said grinding mechanism entirely being removably seated in said well upon insertion into the upper end of said well.

4,138,067

CENTRIFUGAL VACUUM IMPACT PULVERIZING MILLS

René Planiol, Varennes, 36700 Loches, France

Filed Apr. 6, 1977, Ser. No. 785,115
Claims priority, application France, Apr. 7, 1976, 76 10130
Int. Cl.[2] B02C *23/00*
U.S. Cl. 241—275 **7 Claims**



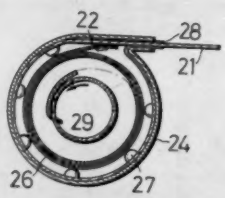
1. A vacuum impact pulverizing mill comprising a housing, a cover sealingly closing said housing, a rotor inside said housing, said rotor having upper and lower portions, motor means for driving said rotor, impact targets encompassing said rotor and fixed to said housing, conduit means for delivering granules to be comminuted to said rotor, substantially along the axis thereof, means for maintaining the interior of said housing under vacuum, and means substantially surrounding the upper and lower portions of the rotor for shielding the rotor against comminuted particles issuing from the targets.

4,138,068

METHOD AND DEVICE FOR DRAWING A ROLLED PHOTOGRAPHIC FILM'S END OUT OF ITS CARTRIDGE

Yoshihiko Kinoshita, 407-3, Mozuyugumocho 2-cho, Sakai, Osaka, Japan (590)

Filed Aug. 29, 1977, Ser. No. 828,489
Claims priority, application Japan, Sep. 1, 1976, 51/105359; Apr. 11, 1977, 52/54609
Int. Cl.[2] G03B *1/02*; B25B *9/00*
U.S. Cl. 242—1 **12 Claims**

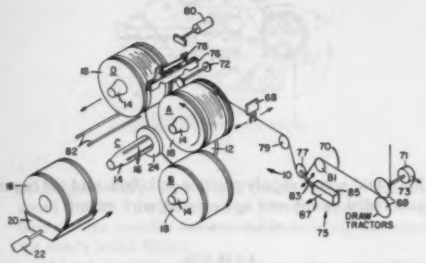


4. A device for drawing a conventional, perforated side edge-type rolled photographic film's leading end out of its cartridge including a flexible film drawing member formed of a resilient steel sheet or the like having a film facing surface of width substantially corresponding to the width of the roll of film and provided with projection means and with a hook on the film facing surface of said member, said projection means compressing the film to warp the leading end radially outwardly as the film facing surface surrounds the rolled film for engagement of the hook with a selected one of the film feeding side edge perforations in the leading end of the roll of film.

4,138,069
WINDING APPARATUS FOR GLASS OPTICAL FILAMENTS

Roy T. Bonzo, and Daniel H. Knowles, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 4, 1978, Ser. No. 902,977
Int. Cl.[2] B65H *54/02, 67/04*
U.S. Cl. 242—18 A 7 Claims



1. An apparatus for winding a filament comprising

a rotatable turret plate having at least two rotatable spindles thereon, one of said spindles being disposed in a winding station, each of said spindles being adapted to support a cylindrical spool having filament gripping means at at least one side thereof,

means for guiding said filament across a central portion of a spool that is disposed in said winding station,

means for moving said filament from the central portion of a spool in said winding station to the filament gripping means on the side thereof,

means for rotating said turrent plate to take a full spool out of said winding station and place an empty spool in said winding station,

means for contacting the filament gripping means of said full spool after said filament has been moved to said gripping means thereby causing said gripping means to grip said filament, said means for contacting thereafter contactng the filament gripping means of the empty spool that has been rotated into said winding station, thereby causing the gripping means of said empty spool to grip said filament, whereby said filament extends between said full spool and said empty spool, and

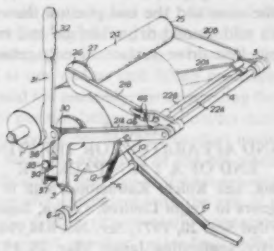
means for severing that portion of said filament extending between said empty and full spools.

4,138,070
YARN WINDER

Gordon Mackie, Belfast, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Jul. 22, 1977, Ser. No. 818,034
Claims priority, application United Kingdom, Aug. 6, 1976, 32830/76
Int. Cl.[2] B65H *67/04, 54/42, 54/54*
U.S. Cl. 242—18 A 12 Claims

1. A winding head comprising a supporting frame, a driving roller, means mounting said supporting frame for movement towards and away from said driving roller, said supporting frame including a plurality of pairs of interconnected arms pivoted about a common axis each said pair of arms including means for mounting a package center for rotation between the arms of each said pair, a support member carried by said frame for engaging at least one arm of each pair of arms in an operative position for supporting a package center in an operative position in which said center is capable of cooperation with said driving roller, means mounting said support member for movement from its supporting position to release a package wound on said center to allow said package to move away from the operative position, each said pair of arms serving to control the movement of a package center along a part circular path into the operative position and then, after release of said support member, to allow a package carried by the center to move along a continuation of the part circular path away from the operative position, means hinging at least a part of one arm

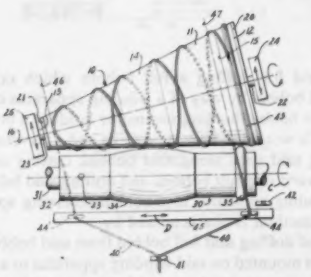


of each pair to allow said arm to yield to automatically release said package as it moves away from the operative position and means preventing said yielding of said arm to release said package until said package leaves the operative position.

4,138,071
DUAL DRIVE FOR CONE WINDING

Richard A. Schewe, Loves Park, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Apr. 3, 1978, Ser. No. 892,631
Int. Cl.[2] B65H *54/42, 54/46*
U.S. Cl. 242—18 DD 10 Claims



1. A method for winding a strand upon a conical package core, comprising the steps of rotating said core and the package wound thereon through a frictional engagement only with at least one segment of said strand overlying a medial portion of the conical surface of said core during the helical winding of said strand thereon, and characterized by frictionally engaging and rotating said core at an end portion of the conical surface near the large end of said core while winding a creeling tail in a narrow band on said core near the end portion, helically winding said strand on said core including the medial portion thereof, and employing said strand wound over the medial portion to automatically lift said core, thereby removing the end portion from said frictional engagement.

2. Apparatus for helically winding a strand upon a conical package core having an axis, an annular medial portion intermediate the ends of said core on the conical surface thereof and an annular end portion near the large end of said core on the conical surface thereof, said apparatus comprising a frictional drive for rotating said core, means for supporting said core in such a manner as to permit free rotation of said core about the axis and to permit lateral movement of said core toward and away from said core-rotating drive, said drive comprising a rotatable drive shaft, a first raised annular drive surface affixed concentric on the shaft in a position to engage only those segments of said strand overlying the medial portion of the

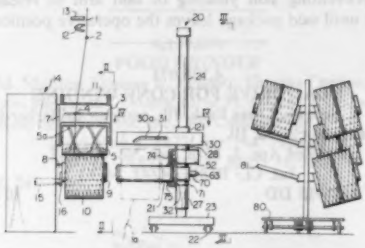
core, and characterized by a second raised annular drive surface affixed concentric on the shaft in a position to engage only the end portion of the bare core, whereby said second drive surface is effective to rotate said core until the strand overlying the medial portion engages the first annular drive surface and thereby lifts the core and the end portion thereof out of engagement with said second drive surface and transfers core-rotation to said first drive surface in engagement with said strand.

4,138,072

METHOD AND APPARATUS FOR TREATING A YARN END OF A YARN PACKAGE

Hideki Aoyama, and Kōichi Kawamoto, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sep. 20, 1977, Ser. No. 834,996
Claims priority, application Japan, Mar. 25, 1977, 52-32048
Int. Cl.[2] B65H *67/00*
U.S. Cl. 242—35.5 A **19 Claims**



1. A method for doffing a full bobbin which comprises winding a full bobbin by way of a winding apparatus comprising a rotatable bobbin-holding means for holding a bobbin on which a yarn is wound to form a package and a traverse means for traversing said yarn along said bobbin, cutting said yarn extending toward said full bobbin, and doffing said full bobbin from said winding apparatus to a bobbin receiving apparatus, wherein said method is characterized by:

a first step of doffing said full bobbin from said bobbin holding means mounted on said winding apparatus to a bobbin-receiving peg mounted on said bobbin-receiving apparatus; and

a second step of rotating said bobbin-receiving peg and said full bobbin around the axis of said bobbin-receiving peg in the same direction as the rotational direction of said bobbin-holding means mounted on said winding apparatus, whereby a yarn end hanging down from said full bobbin is wound back around said full bobbin.

4,138,073

REELED WEB UNWIND STAND

Daniel J. Dowd, Williamsport, Pa., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,177
Int. Cl.[2] B65H *19/18*
U.S. Cl. 242—58.2 **3 Claims**

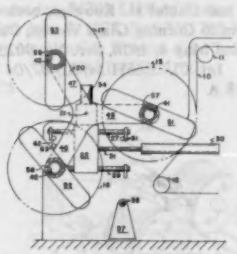
2. A reeled web unwind stand comprising:

A. Rotatively indexed turret means having a plurality of radially projected arms to which respective reels of web material are rotatively secured at distal ends thereof;

B. Reel surface drive belt means for rotating a turret mounted web supply reel indexed to an active supply position;

C. Resistively heated wire means spanning the width of said web and positioned beyond the radial sweep of a depleted reel when rotatively indexed away from said active supply position; and,

D. Air supply means directed against an inside surface of a web tail remaining from said depleted reel when indexed



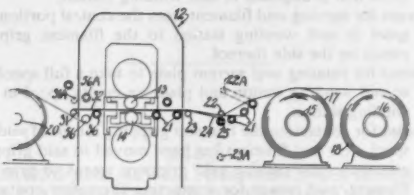
from said active supply position to billow said tail beyond said radial sweep and against said wire means.

4,138,074

FRANGIBLE STRIP THREADING APPARATUS FOR ROLLING MILL

Hugh McD. Ross, Poole, and Edwin Simmonds, Ringwood, both of England, assignors to Loewy Robertson Engineering Co., Ltd., Poole, England

Filed Mar. 25, 1977, Ser. No. 781,323
Int. Cl.[2] B21C *47/04*
U.S. Cl. 242—78.1 **7 Claims**



1. In a strip rolling mill comprising a rolling mill stand, a reel for supporting a coil prior to rolling, and a coiler for receiving rolled strip; apparatus for threading the leading end of frangible strip material from said reel through the roll gap of said stand, said apparatus comprising:

(a) a flexible support band to underlie and support at least a substantial proportion of the width of said strip and movable from said reel towards said stand, said band having a length sufficient to extend from a location adjacent said reel to at least said roll gap;

(b) means for temporarily attaching said leading end to said band over the width thereof with said band located beneath and supporting said strip; and

(c) means for propelling said band from said location adjacent said reel at least to said roll gap, said band comprising means for supporting said strip over at least a substantial portion of the length of said strip from said location to at least said roll gap.

4,138,075

COMBINATION KNOB FOR FISHING REELS

Chauncey F. Korten, 2410 Vinewood Blvd., Ann Arbor, Mich. 48104

Filed Sep. 8, 1977, Ser. No. 831,494
Int. Cl.[2] A01K *89/00*; G05G *1/10*
U.S. Cl. 242—84.1 J **6 Claims**

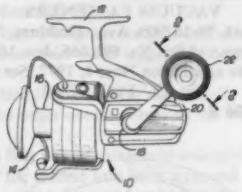
1. In a fishing reel having a winding mechanism and a crank rotatable about an axis for operating the winding mechanism, the combination therewith of:

(a) a knob mounted on said crank for free rotation about its

own axis, said axis being substantially parallel and spaced from each other;

(b) said knob having a maximum diameter of approximately 4.0 centimeters to fit comfortably in the closely cupped hand of the user for power rewind;

(c) said knob having an axially extending annular recess



opening laterally thereof; said recess having a diameter of about 2.5 to 3 centimeters to receive part of the index finger of the user for fast rewind by twirling movement of the user's index finger;

(d) said knob having a thin walled annular part at the outer edge of said knob recess for delicate engagement between the opposed thumb and forefinger of the user.

4,138,076

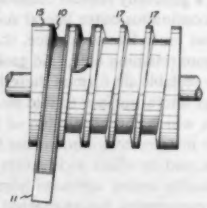
STAPLE CASSETTE

Jack R. Oagley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 717,316, Aug. 24, 1976, abandoned. This application Aug. 17, 1977, Ser. No. 825,354

Int. Cl.[2] B65H *17/52;* **F16B** *15/08*

U.S. Cl. 242—103 **1 Claim**



1. An improved device for storing and feeding preformed U-shaped staple elements comprising a generally cylindrical core member formed with a helical rib and being movable axially, a web of pre-formed U-shaped staple elements wound on said core member in helical fashion following the rib formed on said core member, said rib having a height and pitch coextensive with the height and width, respectively, of said U-shaped staple elements such that the rib houses the staple elements, and a tape attached to said staple elements, said tape being adapted when pulled to cause rotation of said core member and axial movement thereof to feed said staple elements along a fixed path.

4,138,077

HELICOPTER-CARRIED RESCUE APPARATUS

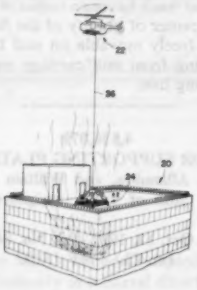
Haruto Okumura, No. 1315, On-aza Shikatebukuro, Urawa, Saitama, Japan

Filed Oct. 18, 1977, Ser. No. 843,349

Int. Cl.[2] B64D *47/00*

U.S. Cl. 244—118 P **29 Claims**

1. A helicopter-carried rescue apparatus comprising a collapsible net assembly having an axis therethrough and, first and second axial ends, said assembly being biased by its own weight to have an upright position with said axis in a vertical direction and said first and second axial ends disposed at the upper and lower ends, respectively, of the net assembly, said net assembly including: a flexible net; a collapsible frame structure having said net fitted thereto, said net being collapsible about said axis between a fully collapsed condition having said net folded about said axis and a fully expanded condition having said net spread out about said axis, the net spread out having a portion stretched on a plane substantially perpendicular to said axis and proximate to said second axial end of the net assembly, and a hoisting system having a lifting mechanism for installation on a helicopter, said mechanism having at least one flexible hoisting line fastened at one end to said lifting mechanism and at the other end to said net assembly, for suspending the net assembly in said upright position below the helicopter during flight, said frame structure being defined by a support member located in proximity to said first axial end of the net assembly, substantially perpendicular to said axis of the net assembly and having an axis substantially coincident with the axis of the net assembly; a plurality of main ribs pivotally connected each at one end to said support member, extending radially outwardly from the support member and away from said first axial end of the net assembly, the individual main ribs being pivotable around said axis of the net assembly between first angular positions closest to the axis of the net assembly and second angular positions remotest from the axis of the net assembly, the frame structure being in the fully collapsed condition thereof when said main ribs are in said first angular positions and being in the fully expanded condition when the main ribs are in said second angular positions; externally threaded screw



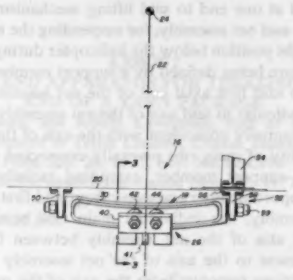
rod rotatably disposed about a center axis substantially coincident with said axis of the net assembly and which axially extends away from said support member toward said second axial end of the net assembly, said screw rod having a leading end at a predetermined distance from said second axial end of the net assembly when the frame is in the fully expanded condition thereof; an internally threaded guide member which is in mesh with said screw rod being movable on the screw rod in opposite directions parallel with the center axis of the screw rod as the screw rod is rotated in opposite directions about the center axis thereof; control ribs extending radially outwardly from said guide member, each pivotally connected at one end to the guide member and at the other end, to an intermediate portion of each of said main ribs, the individual control ribs being pivotable around the axis of the net assembly between first angular positions closest to said axis of the net assembly and second angular positions remotest from the axis of the net assembly and being in the first angular positions thereof, when the guide member is in a position closest to said leading end of the screw rod and in the second angular positions thereof when the guide member is in a position remotest from the leading end of the screw rod; and drive means mounted on said support member being operatively connected to said screw rod, the drive means being operative to drive the screw rod to rotate in either direction about the center axis as the rod drives said guide member to move in either direction along the screw rod.

4,138,078

HELICOPTER CARGO HOOK APPARATUS

Michael L. Hester, Bedford, and Francis E. Tiller, Arlington, both of Tex., assignors to Textron Inc., Providence, R.I.

Filed May 31, 1977, Ser. No. 801,859
Int. Cl.[2] B64D *9/00*
U.S. Cl. 244—137 R **7 Claims**



1. Apparatus for attaching a load bearing line to a helicopter, comprising:

a curvilinear track connected to fixed points on the underside of the helicopter and pivotable about a fixed axis which passes through each end of said curvilinear track and is transverse to the longitudinal axis of the helicopter, said curvilinear track having a radius of curvature extending from the center of gravity of the helicopter,

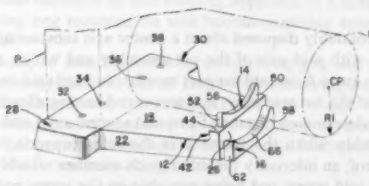
carriage means freely movable on said track, and a cargo hook depending from said carriage means for engaging the load bearing line.

4,138,079

MOTOR SUPPORTING PLATFORM

Gordon F. Ehret, Alhambra, and William N. Rowley, Palos Verdes Estates, both of Calif., assignors to Wylain, Inc., Dallas, Tex.

Filed Oct. 12, 1977, Ser. No. 841,386
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—558 **7 Claims**



1. A platform adapted to provide support for one of a plurality of objects of different sizes comprising:

a base having a primary support extending upwardly therefrom; said primary support having a supporting surface thereon adapted to support a first object having a first size; and at least one secondary support having a supporting surface thereon adapted to support a second object having a second size and having a cavity formed therein adapted to receive said primary support; said cavity and said support surface of said secondary support being formed substantially co-planar with one another;

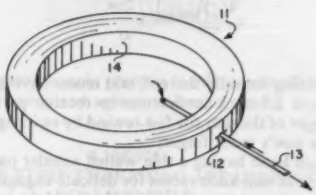
said platform being convertible from supporting said first object on said support surface of said primary support to supporting said second object on said supporting surface of said secondary support by mounting said secondary support over said primary support with said cavity receiving said primary support; said support surface of said secondary support disposed above and in vertical alignment with said support surface of said primary support when said secondary support is mounted over said primary support.

4,138,080

HERMETICALLY SELF SEALING GASKET FOR HIGH VACUUM FASTENERS

Karmen D. Albert, 74-16 58th Ave., Elmhurst, N.Y. 11373

Continuation-in-part of Ser. No. 696,666, Jun. 16, 1976, Pat. No. 4,058,281. This application Nov. 4, 1977, Ser. No. 848,554
Int. Cl.[2] F16B *47/00*
U.S. Cl. 248—206 R **15 Claims**



1. A vacuum-actuated holding device for securing an article having a relatively flat surface against a support having a relatively flat surface, and being capable of maintaining adhesion between the flat surfaces of the article and support for a prolonged period of time by means of an external vacuum source having a needle valve pin, comprising:

a rubber gasket positionable between the flat surfaces of the article and support in abutting relationship therewith, said gasket having a generally tubular cross-section defined by a peripheral, continuous outer lateral surface and peripheral, continuous inner lateral surface, the latter of which defines a vacuum retaining area, said gasket also including a hermetically sealable slit formed therethrough extending from said outer lateral surface to said inner lateral surface thereof and in which the needle pin of the external vacuum source be inserted to communicate with said vacuum retaining area, and to effect evacuation thereof, said slit being hermetically sealed upon withdrawal of said pin, aided by the compressing forces exerted on said gasket by the article and support, so as to maintain the vacuum established in said vacuum retaining area.

4,138,081

FOLDABLE RHOMBIC HOOK BLANK

Ragnar H. Nilsson, Am Ameisenbrunnen 4, Hanau am Main, Fed. Rep. of Germany

Filed Dec. 27, 1977, Ser. No. 865,103
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1976, 7641142[U]
Int. Cl.[2] A47G *1/16, 5/08*
U.S. Cl. 248—300 **4 Claims**

1. A foldable support hook blank formed of cardboard, paper or the like for hanging objects such as articles of clothing, handbags, towels, etc., comprising:

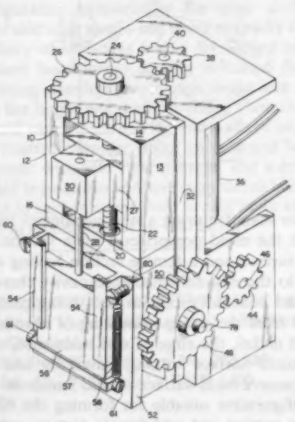
(a) a rhombus (**14**) having two diagonally opposite obtuse corners (**18**),
(b) a first fold line (**16**) extending between the obtuse corners,
(c) a pair of second fold lines (**20**) each extending radially from one of the obtuse corners to adjacent outer edges of the rhombus, said second fold lines being symmetrical about said first fold line,
(d) a pair of equal length cuts (**22**) individually extending inwardly from said outer edges along the second fold lines, and
(e) a pair of third fold lines (**24**) individually extending radially from the other obtuse corner to the inner ends of said cuts,
(f) whereby a first pair of congruent triangles (**28**) is formed outward of the second fold lines, a second pair of congruent triangles (**26**) is formed outward of the third fold lines, and a third pair of congruent triangles (**32**) remains on opposite sides of the first fold line, the first pair of triangles being adapted to remain in a common plane, after the blank is folded, for attachment to a support surface, the second pair of triangles being adapted to be folded to partially overlie each other and to be secured together, and the third pair of triangles forming a hook member projecting outwardly from said common plane.

4,138,082

REMOTELY OPERATED, X-Y TRANSLATION SLIDE WITH STATIONARY MOTORS

Mohammad Fatemi, McLean, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1977, Ser. No. 801,446
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—419 **1 Claim**



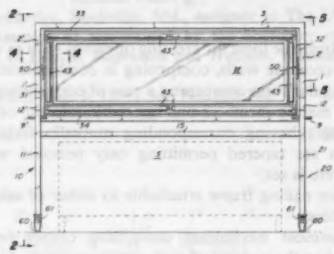
1. Apparatus for providing two dimensional translation in a vertical plan comprising:
a first means mounted relative to a backing plate parallel to said vertical plane and adapted for linear motion in a first direction with respect to said plate;
a second means mounted relative to said backing plate, parallel to said vertical plane, and adapted for linear motion in a second direction substantially orthogonal to said first direction;
a third means moveably mounted into said second means, and a pushrod means mounted on said first means for providing linear translation to said third means in said first direction in response to said linear movement of said first means;
a fourth means mounted relative to said backing plate and adapted for rotational motion with respect to said plate;
a first drive gear means mounted relative to said first means for operationally connecting said first means to said fourth means whereby rotational motion of said fourth means causes movement of said first means in said first direction;
a first motor drive means for driving said first drive gear means;
a fifth means mounted relative to said backing plate and adapted for rotational motion with respect to said plate; and a second gear means mounted relative to said second means for mechanically connecting said second means to said fifth means whereby the rotational motion of said fifth means causes translation of said second means in said second directions and
a second motor drive means for driving said second gear means independent of said first motor drive means.

4,138,083

DEMONSTRATION MIRROR MOUNTING

Samuel Spiegel, Silver Spring, Md., assignor to Hamilton & Spiegel, Inc., Tuxedo, Md.

Filed Jul. 15, 1977, Ser. No. 815,948
Int. Cl.[2] A47G *1/24*
U.S. Cl. 248—474 **4 Claims**



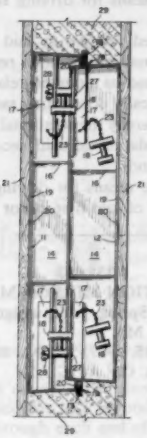
1. In combination with a support adapted to have the top thereof viewed reflectively in a lateral direction,
(a) a wheeled base of skeletal formation comprising a pair of end units, each with a pair of downwardly extending spaced legs free of any bracing therebetween at the lower portions thereof to form four downwardly extending spaced legs disposed at the four corners of a rectangular floor plan to permit free wheeling movement of said base relative to said support,
(b) a frame member of rectangular outline extending upwardly from the top of said base comprised of a vertical post extending from the center of the top of each of said end units, with a horizontal beam extending between the upper ends of said vertical posts,
(c) each of said vertical posts being of hollow tubular construction and constituted by a plurality of relatively telescopic parts,
(d) a perimetric housing with a reflecting mirror carried thereby pivotally mounted between said vertical posts on a horizontal axis, comprising pivotal mounting means extending inwardly from the upper telescopic part of each post at the same distance below said horizontal beam,
(e) means for varying the level of said pivotal horizontal axis with respect to the top of said support comprising threaded screw means having a large pitch on the interior of said telescopic parts, with rotary actuating means therefor beyond the lower end of each of said parts, and
(f) connections between said frame member and housing for adjusting the angularity of said reflecting mirror with respect to the top of said support.

4,138,084

ADJUSTABLE FOUNDATION WINDOW FORM

John A. Reid, 9945 S. 1300 West, Riverton, Utah 84065

Filed Jul. 8, 1977, Ser. No. 813,831
Int. Cl.[2] B28B *7/30*
U.S. Cl. 249—83 8 Claims



1. An adjustable form for creating openings such as windows in poured concrete walls, comprising in combination:

a rectangular form comprising a pair of cooperating rectangular mating members one insertable into the other, said members having corresponding mutually facing edges which are tapered permitting easy removal when the concrete is set;

a wooden nailing frame attachable to either of said mating members;

an adjustment mechanism comprising corner braces attached to the corners of said mating members and adjustment spacers for placement between corresponding braces of both members and fastened into place by fastening means; and

attachment means comprising a flange extending inwardly from each side of said mating members with apertures therein for accepting nails to attach said mating members to forms into which concrete is poured to form concrete walls.

4,138,085

PRECISION BLOCKING OF LENS BLANKS

Bela J. Bicskei, 7 Hemenway Rd., Framingham, Mass. 01701

Continuation-in-part of Ser. No. 657,455, Feb. 12, 1976, Pat. No. 4,077,722. This application Jan. 31, 1977, Ser. No. 763,191
Int. Cl.[2] B22D *19/00;* B23Q *17/00;* B25B *1/24;* G01B *9/00*
U.S. Cl. 249—83 8 Claims

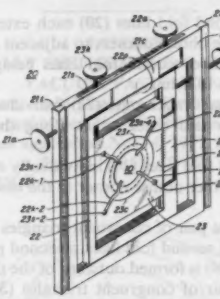
1. Apparatus for the precision manipulating of lens blanks comprising

a frame;

means on said frame for mounting the lens blank within said frame;

means effecting translational movement of the mounting means relative to said frame;

means mounting said frame on auxiliary equipment including means moveable towards said frame for bringing a preformed block into contact with an adhesive strip positioned on said lens blank positioned at a prescribed translational position relative to said frame.

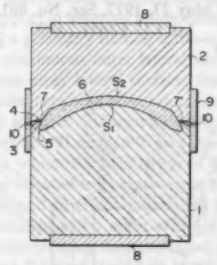


4,138,086

MOLD FOR MANUFACTURING CONTACT LENSES

Yutaka Mizutani, Nagoya; Yoshiharu Miwa, Gifu, and Mitsuru Oshima, Obu, all of Japan, assignors to Nippon Contact Lens Manufacturing Ltd., Nagoya, Japan

Filed Jun. 22, 1977, Ser. No. 808,857
Claims priority, application Japan, Apr. 28, 1977, 52-48397
Int. Cl.[2] B29D *11/00*
U.S. Cl. 249—116 7 Claims



1. A mold for manufacturing a silicone contact lens characterized in that the mold comprises a male section having a convex mold surface and a female section having a concave mold surface to thereby define a mold cavity therebetween, said convex and concave mold surfaces being plated with a metal selected from the group consisting of chromium, hard chromium and nickel, the edge of said male section adjacent said convex mold surface turning upwardly and inwardly toward said concave mold surface of said female section so as to have a configuration suitable for forming the edge of the lens, said male section and said female section, when joined together, coming into edge-to-edge contact with each other only at a portion of the mold cavity lying above and adjacent the edge outer of said mold cavity.

4,138,087

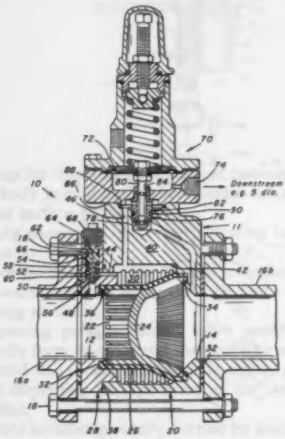
AXIAL FLOW THROTTLING VALVE

John M. Kruse, and Leland E. Gelnett, both of DuBois, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 697,492, Jun. 18, 1976, abandoned. This application Sep. 29, 1977, Ser. No. 837,954
Int. Cl.[2] F16K *7/07, 31/365;* G05D *16/16*
U.S. Cl. 251—5 1 Claim

1. A valve for controlling the flow of fluid therethrough

comprising a body having a fluid passage therethrough and a control chamber therein, unitary cage means through which fluid may flow, mounted in said body, said cage means having a wall with first and second portions separated by a baffle, each of said portions having a plurality of openings therein for enabling fluid flow from an inlet through openings in said wall to the exterior of said cage means and from the exterior of said cage means through other openings in said wall to said outlet, said first portion extending from the inlet of said body to said baffle and having a generally cylindrical shape, and said second portion extending from said baffle to the outlet of said body and having a generally frustoconical shape, resilient boot



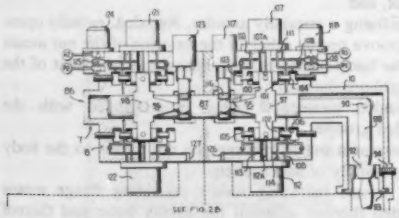
means mounted over said cage means, said resilient boot means having a configuration substantially the same as the outer configuration of said cage means and being normally in contact with the periphery of said cage means for sealing said openings, said resilient boot means having in-turned flanges on either end, allowing insertion of said cage means into said boot means through the larger end, and providing clamping of said boot between said cage means and the end walls of said control chamber, said control chamber being an enlarged bore from one end concentric with said fluid passage, and a cover over said one end, said boot means and said cage means being seated at the other end in said enlarged bore in said body and seated at said one end in a counterbore in said cover.

4,138,088

DEVICE FOR CONTROLLING HYDRAULIC MOTORS

Luc P. Cyrot, Mission Viejo, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Dec. 30, 1976, Ser. No. 755,935
Int. Cl.² F16K *31/12*; F01B *1/00*
U.S. Cl. 251—30 **20 Claims**



1. A device for operating a valve comprising a linearly movable command shaft of hybrid force displacement type having means for connection to said valve, a drive member having a pivotal connection to the command shaft for linearly shifting the same, first and second drive elements connected to said drive member on opposite sides of said pivotal connection, each of said drive elements including a pair of first and second drive units acting on said drive member in opposite directions about said pivotal connection, means for varying the force with which said drive units act on said drive member, said drive units being actuated by fluid pressure from a source, said drive elements normally imparting equal and oppositely directed torques to said drive member about said pivotal connection for linearly moving the command shaft and a detector for detecting unequal application of torques to said drive member by said drive elements and being actuated in response to detection of said unequal application of torques, said detector upon actuation thereof causing supply of fluid under pressure from said source to each of said drive elements to be cut off

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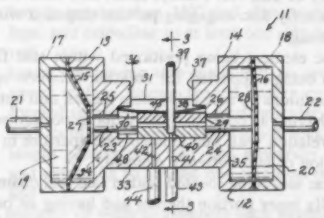
4,138,089

SLIDE VALVE

Charles J. McCarthy, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Aug. 9, 1977, Ser. No. 823,142
Int. Cl.² F16K *31/128*
U.S. Cl. 251—61 **15 Claims**



1. A slide valve assembly comprising a support, a stationary valving member on said support provided with a first valve face having a first port, first fluid conduit means communicatively connected to said first port, a movable valving member having a second valve face slidably engaged with said first valve face and having a second port registrable with said first port, second fluid conduit means communicatively connected to said second port, guide means constraining sliding movement of said movable valving member relative to said stationary valving member to a linear path toward and away from a position of registration of said ports, and yieldable means urging said valving members together so that said valve face sealingly engages the first valve face, at least one of said valve faces having a convex contacting surface containing its port and extending along said linear path.

3. The slide valve assembly of claim 1, and fluid pressure actuating means operatively connected to said movable valving member.

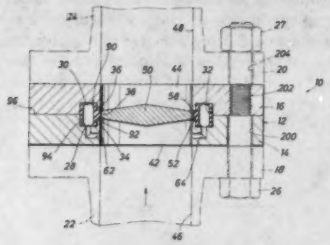
4. The slide valve assembly of claim 3, and wherein said fluid pressure actuating means comprises a diaphragm chamber provided with a flexible diaphragm, means coupling said diaphragm to said movable valving member, and control fluid conduit means communicatively connected to said chamber.

4,138,090

BUTTERFLY VALVE WITH TWO-WAY PRESSURE ENHANCED SEALING

Joe D. Sumner, 6903 Alderney Dr., Houston, Tex. 77055, and Carlton H. Stanley, 2002 Cobble Creek Dr., Houston, Tex. 77090

Filed Mar. 4, 1977, Ser. No. 774,642
Int. Cl.[2] F16K 51/00
U.S. Cl. 251—152 35 Claims



1. A high pressure butterfly valve having pressure enhanced sealing, said butterfly valve comprising:

a pair of valve body sections being joined to define a valve body, said valve body being connectable to a flow line and being formed to define a flow passage;

said valve body sections cooperating to define an annular seal chamber having an annular seal aperture of smaller dimension than the dimension of said seal chamber;

valve stem means being rotatably supported by said valve body and having a valve operating portion thereof extending externally of said valve body, said valve stem means having a butterfly disc engaging portion disposed within said flow passage;

a butterfly disc element being positioned within said flow passage and being supported for rotation between open and closed positions by said valve stem means, said butterfly element having an outer periphery that is positioned in juxtaposed relation with said annular seal aperture in the closed position of said butterfly element;

an inner annular seal being located within said seal chamber at the radially inner portion thereof and having an outer annular pressure responsive body sealing portion and an inner annular disc sealing portion, said disc engaging portion extending through said annular seal aperture into said flow passage and having sealing engagement with the periphery of said butterfly disc element in the closed position of said butterfly disc element;

an outer annular seal being located within said seal chamber at the radially outer portion thereof and being positioned in radially spaced relation with said inner annular seal, said outer annular seal establishing sealing contact with each of said valve body sections and bridging the joint between said body sections, said outer annular seal being urged into sealing engagement with said body sections responsive to pressure within said seal chamber;

passage means being defined by said butterfly valve and communicating fluid pressure from said flow passage to said seal chamber;

said inner sealing portion of said inner annular seal being urged toward said periphery of said valve disc responsive to pressure acting with said annular seal chamber;

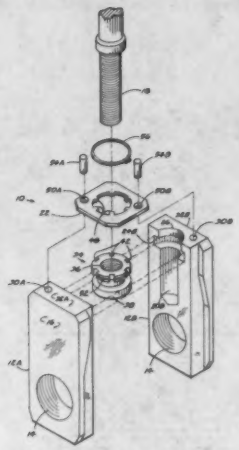
stem seal means being formed integrally with said inner and outer seals and being in sealing engagement with said valve stem means, the sealing ability of said stem seal means also being enhanced by fluid pressure within said annular seal chamber.

4,138,091

DRIVE NUT AND TORQUE PLATE ASSEMBLY

John K. McGee, Houston, Tex., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 25, 1977, Ser. No. 800,437
Int. Cl.[2] F16K 31/50
U.S. Cl. 251—267 7 Claims



1. Apparatus, including:

(a) a stem having external threading thereon;

(b) body means having means defining a socket therein, which opens outwardly of the body means;

the stem being axially received in the socket from outwardly of the body means;

(c) connecting means threadably connecting the stem with the body means to provide extension and retraction of the stem relative to the body means upon relative rotation of the stem and body means,

said connecting means comprising:

nut means having a throughbore lined with internal threading which is complementary to the external threading on said stem,

said nut means being threadably received on said stem,

means defining a coaxially annular, rounded, radial projection on one of the exterior of the nut means and the body means intermediate the axial extend of the throughbore thereof, and

means defining a coaxially annular, rounded, radially opening, groove on the other of the exterior of the nut means and the body means intermediate the axial extent of the throughbore thereof,

the rounded projection being interdigitated with the rounded groove;

and securement means pinning the nut means to the body means distally of said socket;

the nut means including means providing flange means mounted thereon adjacent the axially outer end thereof relative to the said socket, and

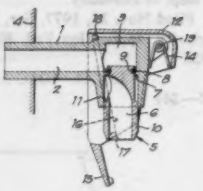
said securement means including a plurality of pins projecting axially through said flange means and being secured in said body means distally of said socket.

4,138,092

TAP FOR DISPENSING CARBONATED BEVERAGES

Ramon Apellaniz, Lasne-Chapelle-Saint-Lambert, Belgium, assignor to Euracom S.A., Brussels, Belgium

Filed Mar. 14, 1977, Ser. No. 776,614
Claims priority, application France, Apr. 14, 1976, 76 11067
Int. Cl.[2] F16K *3/16*
U.S. Cl. 251—325 2 Claims



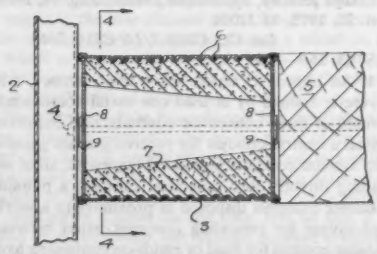
1. A tap for dispensing carbonated beverages, comprising:
a tap body having a chamber therein extending through an outer surface of the body;
a supply passage in said body extending laterally from said chamber;
a valve member slidable in said chamber and extending outwardly of said body through said outer surface and having an outer end;
a dispensing passage in said valve member extending inwardly from its outer end then curving smoothly laterally toward said supply passage, said supply passage and all of said dispensing passage being of the same uniform cross section;
a control member pivotally carried by said body and linked to said valve member for sliding said valve member in said chamber between a first position wherein said curved portion of said dispensing passage is aligned with said supply passage and a second position wherein said dispensing passage is displaced from said supply passage;
said chamber being provided with a circular inwardly extending rib, between said supply passage and said outer surface, surrounding said valve member, a groove around said valve member adjacent the inner end thereof and a sealing ring in said groove sealingly engaging said rib when said valve member is in said second position; and
said chamber and valve member being provided with cooperating stop shoulders limiting movement of said valve member to said first position.

4,138,093

GUARD RAIL CELL

Lester N. Meinzer, 4331 Sierra Madre Dr., Sacramento, Calif. 95825

Filed May 18, 1977, Ser. No. 797,924
Int. Cl.[2] A01K *3/00*
U.S. Cl. 256—13.1 6 Claims



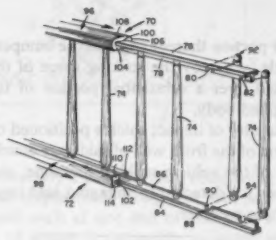
1. A guard rail system comprising a support post, a guard rail member attached to said post and a cell member attached between said guard rail and said post, said cell member comprising a cylindrical metallic container having circumferentially disposed ribs thereon, damping material disposed on the inner periphery of the container, in such a manner to provide a truncated conical void at the core of said container, so that upon compression the larger portion of the conical void is closest to the guard rail member and resistances increases upon continued deformation and the ribs encourage linear deformation of the container rather than a rupture.

4,138,094

ADJUSTABLE RAILING ASSEMBLY

Peter Thir, P.O. Box 1036, La Plata, Md. 20646

Filed Mar. 31, 1977, Ser. No. 783,317
Int. Cl.[2] E04H *17/00*
U.S. Cl. 256—67 11 Claims



1. An adjustable railing section, including:
an upper rail having side walls and an undersurface, said undersurface having spaced, upper cylindrical sockets formed therein extending perpendicular to the longitudinal axis of said upper rail, said upper sockets having an arc length greater than 180° and downwardly facing openings, and extending to at least one side wall of said upper rail;
a lower rail having side walls and an upper surface, said upper surface having spaced, lower cylindrical sockets formed therein extending perpendicular to the longitudinal axis of said lower rail, said lower sockets having an arc length greater than 180° and upwardly facing openings, and extending to at least one side wall of said lower rail; and
a plurality of vertical members each having an upper cylindrical formation on one end and a lower cylindrical formation on the opposite end, said upper and said lower cylindrical formations being slidably receivable within said upper and said lower cylindrical sockets along the longitudinal axes of said sockets, respectively, to connect said upper and said lower rails, said upper and said lower cylindrical formations being rotatable within their associated upper and lower sockets over a predetermined range to provide for adjustments in the angles between said upper and said lower rails and said vertical members, and being retained against separation from said rails in a direction perpendicular to said longitudinal socket axes by the said greater than 180° arc lengths of their associated sockets.

4,138,095

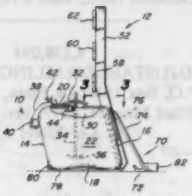
ROADWAY BARRIER

Donald F. Humphrey, 2601 Mason St., Wheaton, Md. 20902

Filed Jul. 27, 1977, Ser. No. 819,348
Int. Cl.[2] E01F *3/00*
U.S. Cl. 256—64 16 Claims

1. A temporary barrier for use on roadways comprising:
(a) a base member including an elongated body having front, rear, top, bottom and end walls,
(b) said elongated body being hollow to provide a reservoir,

(c) ballast,
(d) opening means in said body for adding said ballast to the reservoir,
(e) the front wall of said elongated member being disposed at an angle to the vertical so that the upper limit thereof projects over the roadway in advance of the remainder of the front wall,
(f) the elongated body being of a height that the projecting



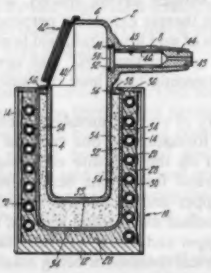
upper portion thereof engages the bumper or fender of the vehicle, whereby the striking force of the vehicle is distributed over a substantial portion of the length of the elongated body,
(g) a plurality of impact shields positioned on the projecting portion of the front wall of said base member to absorb the force of the vehicle striking the same, and
(h) means for detachably engaging said impact shields with said base member.

4,138,096

COMBINED CRUCIBLE, TUNDISH AND POURING SPOUT

Raymond R. Boucher, Tequesta, and Robert A. Metcalfe, West Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1977, Ser. No. 865,085
Int. Cl.[2] F27B *14/02*
U.S. Cl. 266—240 **1 Claim**



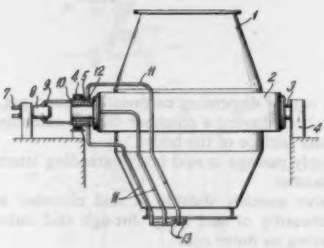
1. A combined crucible, tundish, and pouring spout device comprising a crucible of cup-like shape having an integral extension on one side on the top thereof, said extension forming a tundish with the one side of said cup-like shape when said crucible is rotated approximately 90° with that one side positioned downwardly, a tubular spout extending at an angle of 90° from the closed side of said extension, and plug means in said tubular spout for blocking said spout, said plug means being constructed of a material which can be melted by contact with molten metal, said crucible and tundish have an opening on the other side of the top of the crucible of cup-like shape from said extension and over said extension, a heat shield means positioned over said opening for reflecting heat on an exposed part of said tundish and said spout, said heat shield means comprising a heat shield extending from the top of the crucible of cup-like shape located opposite the spout to the top of said extension, said heat shield means being spaced from said opening and not providing a closed cover.

4,138,097

METALLURGICAL VESSEL

Hans Farber, Oberhausen, Fed. Rep. of Germany, assignor to Gutehoffnungshütte Sterkrade Aktiengesellshaft, Oberhausen, Fed. Rep. of Germany

Filed Nov. 22, 1977, Ser. No. 853,878
Claims priority, application Fed. Rep. of Germany, May 1, 1977, 2703955
Int. Cl.[2] C21C *5/46*
U.S. Cl. 266—241 **8 Claims**



1. A metallurgical vessel for use as a converter comprising a receptacle, means for tiltably supporting said receptacle including a pair of journals forming an axis about which said receptacle is tiltable a plurality of bores extending in a direction parallel to the axis of said supporting journals and disposed in an annular arrangement coaxial with the axis of said supporting journals and providing passages for feeding media therethrough to the interior of said container for treating the contents thereof and/or for feeding media to said receptacle for cooling said receptacle, each said bore having an inlet end for receiving the media and an outlet end for supplying the media to said receptacle, a distributor, and delivery pipes each connected at one end thereof to said distributor for receiving the media therefrom and at the other end thereof to said inlet end of one of said bores wherein the improvement comprises a bushing fitted on one of said supporting journals, said plurality of bores located in and extending axially through said bushing radially outwardly from said supporting journal.

4,138,098

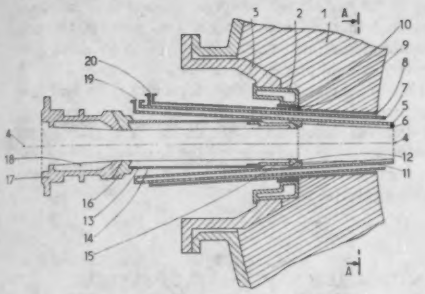
METHOD OF BLOWING SMELTING SHAFT FURNACES AND TUYERES USED FOR SAID BLOWING

Pierre Leroy, Saint-Germain-en-Laye, France, assignor to Creusot-Loire, Paris, France

Filed Aug. 6, 1976, Ser. No. 712,325
Claims priority, application France, Aug. 14, 1975, 75 27370; Oct. 21, 1975, 75 32091
Int. Cl.[2] C21B *7/16*; C21C *5/48*
U.S. Cl. 266—268 **3 Claims**

1. An improved tuyere for a blast furnace, wherein: said tuyere is defined by at least one metal component and being formed of three concentric conduits, said improvement comprises: a central conduit for receiving a hot gaseous blast and two annular conduits associated therewith, all of said conduits leading directly into said blast furnace; a plurality of small diameter channels disposed in proximity to a working end of said tuyere for providing communication between an outer annular conduit for fluid or emulsion containing hydrocarbons, and an intermediate annular conduit for the oxygen or oxidizing gas, enabling atomization of part of the flow of hydrocar-

bons in the stream of oxygen or oxidising gas prior to exit of the tuyere and the remainder of the flow of hydrocarbons



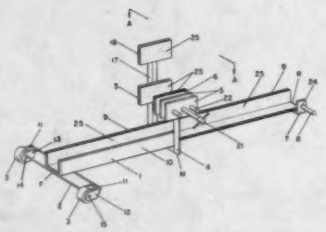
being contained in said outer conduit along a path defined by a progressively decreasing cross-section.

4,138,099

MATERIALS HANDLING DEVICE

Clem C. Englehart, P.O. Box 687, Aztec, N. Mex. 87410

Filed Apr. 17, 1978, Ser. No. 897,049
Int. Cl.² B25B *11/00*
U.S. Cl. 269—17 **1 Claim**



1. A devise for handling sheets of flat materials such as plywood, glass, masonite, or doors, said devise comprising of:

a. a base channel having a front end, a rear end, and a midpoint

b. a cross member having two wheel access notches, two wheel supports, and two end plates

c. two wheels and axles,

d. a clamp support, having a long support arm and a short support

e. a clamp back

f. a material support

g. a clamp with a clamp face plate

h. a handle support

i. a handle

j. pliable material

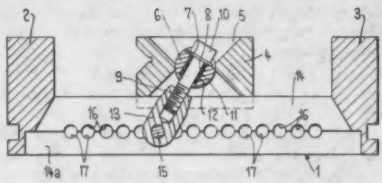
wherein the cross member, is rigidly affixed, such as, by welding at right angles to the base channel at the front end thereof, and the cross member having mounted therein a wheel on its axle in the wheel access notch, each axle being mounted between the wheel support and end plate, thereof; and the clamp support being rigidly affixed to the base channel, such as by welding, at the midpoint of the base channel in a position such that the base channel is perpendicular to the plane of the support member; the clamp is rigidly affixed, as by welding to the top of short support, so that the face of the clamp is perpendicular to the plane of the cross support, the clamp back is affixed such as by welding at a point on the long arm so that it is parallel to and faces the clamp; the material support is affixed such as by welding to the top of the long arm in such a position that it is parallel to and in the same plane as the clamp back; the handle support is attached by welding to the rear end of the base channel, and the handle attached thereto; and the pliable material affixed as by gluing to the surfaces of the base channel, clamp back, material support and clamp face plate that engage the materials to be handled.

4,138,100

VICE, PARTICULARLY PARALLEL VICE

Josef Krummenacher, Muri, Switzerland, assignor to Apparate- und Werkzengbau AG, Muri, Switzerland

Filed Nov. 22, 1977, Ser. No. 854,002
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 2652946
Int. Cl.² B23Q *3/04*
U.S. Cl. 269—137 **9 Claims**



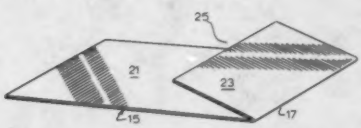
1. A vice, particularly a parallel vice, comprising: a bed; at least one vice jaw displaceable along said bed; and two fixed vice jaws disposed each at one end of said bed; a clamping spindle one end of which is swingably mounted in said displaceable jaw, the swinging range of said spindle including positions of the spindle axis inclined to each side from a central position perpendicular to the longitudinal direction of said bed, such that said displaceable jaw may be clamped against each of said fixed vice jaws by tightening said spindle in an inclined position; and anchoring means on the other end of said spindle engageable into rows of anchoring recesses of said bed, said anchoring means being disengageable from said anchoring recesses when said spindle is loosened for fast adjustment of said displaceable jaw with its spindle along said bed.

4,138,101

HIGH SPEED INSERT HANDLING MECHANISM AND METHOD

Hans G. Faltin, 4135 Wilshire Dr., York, Pa. 17402

Division of Ser. No. 688,538, May 21, 1976, Pat. No. 4,106,762. This application Feb. 2, 1977, Ser. No. 765,069
Int. Cl.² B65H *5/30*
U.S. Cl. 270—57 **5 Claims**



1. A high speed feeder for discharging paper sheet products and the like individually, having a long panel portion and a short panel portion folded back thereover to present a folded front edge and trailing short panel edge, from a source of supply presenting the products with an accessible short panel comprising, in combination:

means for engaging said products and moving them with fold forward from said source by impacting the edge of the short panel portion trailing said front edge;

means for grasping and individually accelerating the so moved products for feeding;

means forming a pathway for said products between the source and the means for accelerating, wherein the short panel portion is approximately between one-quarter and

one-half the length of the long panel portion, said means for engaging comprises at least one protrusion extending outwardly of and carried by a high speed rotary drum, support means for said source of supply, the pathway means comprising movable guide means between the source of supply and the drum forming a bridge hingeably connected to said support means at said source for motion relative to the drum, said rotary drum including grooves in the periphery thereof for receiving said bridge thereinto, and remotely actuable means for raising and lowering said bridge to control feeding of said products.

4. In combination, a source of products, a printing press with continuously moving webs and feeding apparatus for individually discharging paper products of newsprint stock or the like having a long panel portion and a short panel portion partially folded back thereover along a folded front edge to present a trailing edge on said short panel portion when moved from said source of supply to predetermined locations between the continuously moving webs of the press,

means for engaging said products and moving them from said source by impacting the short panel portion trailing edge; and,

means for individually accelerating the so moved products for discharge into said predetermined locations, wherein said feeding apparatus for discharging products comprises a feeder wherein said source comprises:

a conveyor for supporting said products thereabove by said folded front edge with said products at an angle to the horizontal, said conveyor moving said products forward to a front of the source of supplying with said trailing edges facing the front;

pressure sensitive means for sensing the forward force of the products as a result of said conveyor and controlling the conveyor operation between pressure limitations;

a rotary drum being supported adjacent said conveyor with protrusions to impact said trailing edge to push said products from said source; and,

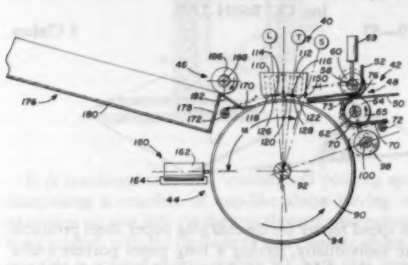
means for guiding the so discharged products to said web locations.

4,138,102

AUTOMATIC DOCUMENT PROCESSING DEVICE

Allen J. Palmer, Bedford, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,660
Int. Cl.[2] B65H *5/22, 29/30, 29/06*
U.S. Cl. 271—3 **19 Claims**



1. An automatic document handling and processing system having a processing device for processing a document and a unit for feeding the document to the processing device and for removing the document from the processing device after processing, comprising:

a gripper bar,

first magnetic means selectively activated to retain said gripper bar in a position removed from the processing device,

second magnetic means on the processing device for attracting said gripper bar to a document retaining position on the processing device, and

sensor means operable in response to the presence of a document in the system for deactivating said first magnetic means such that said gripper bar is attracted to said second magnetic means on the processing device to clamp said document to said processing device,

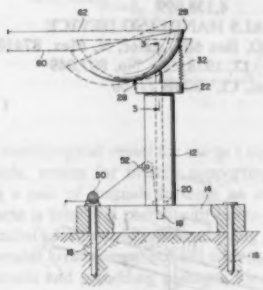
said sensor means being positioned remote from said first magnetic means upstream of the feedpath of the document such that the deactivation of said first magnetic means corresponds to the passage of the leading edge of the document between said first magnetic means and the processing device.

4,138,103

MODEL AIRCRAFT CONTROL SYSTEM

Alan W. Babcock, 2839 W. Fairmont #103, Fresno, Calif. 93705

Filed Aug. 10, 1977, Ser. No. 823,359
Int. Cl.[2] A63H *27/04*
U.S. Cl. 272—31 A **1 Claim**



1. A model airplane control system comprising an upstanding tower, a revolvable disc mounted in free rotatable relation to the upper end of said tower; a rocking member pivoted on said disc above said disc and biased by spring means toward said disc; means on said rocking member to wiremount a model airplane; a rod slidabley mounted in said tower, said rod terminating in a convex upper end with said convex end of the rod bearing against the underside of said rocking member; a control device outside the line of flight of said airplane including a pivoted stick, a control line connected from said stick to the lower end of said rod to actuate said rod in axial motion and thereby pivot said rocking member in a desired direction for correspondingly controlling said airplane from said wires connected to said rocking member, in which a convex surface is formed on the underside of said rocking member so as to maintain the convex end of the rod in direct bearing relation with the rocking member as the rocking member rotates with respect to the rod and as the rocking member is pivoted by axial movement of the rod, and the bias of the spring means.

4,138,104

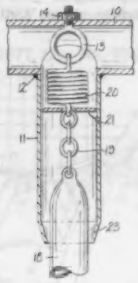
SWING BRAKE SYSTEM

William C. D'Amicis, 87 E. Brown St., West Haven, Conn. 06516

Filed Jun. 9, 1977, Ser. No. 805,091
Int. Cl.[2] A63G *9/00*
U.S. Cl. 272—85 **7 Claims**

5. A brake for a swing having a rigid side support comprising a short brake tube, a spring, a short flexible element connected to one end of the spring, means for rigidly mounting the brake tube vertically on a fixed mounting element, means for connecting the flexible element to the rigid side support and means

for securing the other end of the spring to the mounting element so that the spring will be within the brake tube such that



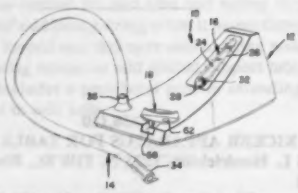
the spring, the flexible element and part of the side support are within the brake tube when the swing is at rest.

4,138,105

RESPIRATORY EXERCISER

Darrell M. Hunger, Oakland; Lee E. McGill, Albany, and Raymond D. von Alven, San Raphael, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Feb. 28, 1977, Ser. No. 772,614
Int. Cl.[2] A63B *23/00*
U.S. Cl. 272—99 **11 Claims**



1. A respiratory exercising device comprising:
a. a closed container,
b. a transparent hollow tubular column fixedly associated with the container and angularly inclined in an upwardly direction with respect to the base of the container, said column having vent means at its lower end and a passageway at its upper end in communication with a first opening in the container,
c. variable aperture means for selectively regulating flow of air into the container,
d. a breathing tube in communication with a second opening in the container; and
e. an air flow indicating member within said column, and adapted for movement in an upwardly direction in response to air flowing through said vent means into said column as a consequence of inhaling through said breathing tube.

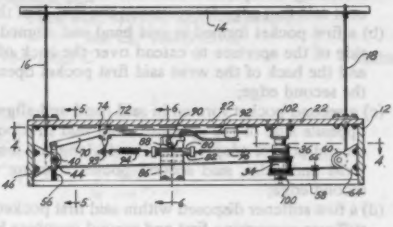
4,138,106

WEIGHT TRAINING APPARATUS

Robert F. Bradley, New Buffalo, Mich., assignor to Micro Circuits Company, New Buffalo, Mich.

Filed Aug. 15, 1977, Ser. No. 824,869
Int. Cl.[2] A63B *21/02, 21/24*
U.S. Cl. 272—129 **10 Claims**

1. A weight training apparatus comprising a cable for pulling in a training exercise, a reel on which said cable is wound and unwound, a brake device connected to said reel for controlling the force required to unwind said cable, and a means responsive to the initial pull of said cable for setting said brake device at a selected unwinding force for said cable including a moveable brake setting means and a moveable element on which said cable is trained shiftable in response to the initial movement of



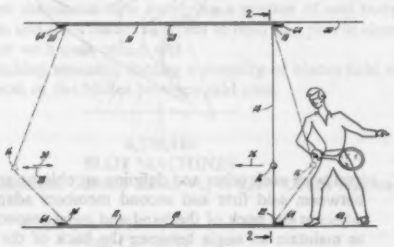
said cable, and a linkage means interconnecting said element and said brake setting means.

4,138,107

SPORTS TETHERED BALL PRACTICE DEVICE

Zbig Janis, 334 Riverside Dr., New York, N.Y. 10025

Filed Mar. 25, 1977, Ser. No. 781,120
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **5 Claims**



1. A tennis practice device, comprising first and second rigid guide rails mounted in parallel to upper and lower vertically spaced-apart support members respectively, first and second wheeled carriage means mounted respectively for movement along said first and second rigid guide rails, a ball, an elastic cord member, means for mounting said ball intermediate the ends of said cord member, said elastic cord member having one of its ends attached to said first wheeled carriage means and its other end attached to said second wheeled carriage means, said elastic cord member being under tension prior to said ball being hit by a player, said ball being supported by said cord member at a selected vertical location between said rigid guide rails for movement in a direction substantially to said rigid guide rails under guidance of said cord member and said wheeled carriage means, and stop means mounted at a predetermined position in said first and second rigid guide rails and arranged to stop the forward motion of said wheeled carriages imparted thereto by a force exerted on said ball, said tennis practice device having an open space for free access to said ball to permit stroking said ball with proper timing.

4,138,108

ATHLETIC HAND/WRIST POSITIONER

Charles H. Robinson, 1016 Thompson Ave., Glendale, Calif. 91201

Continuation of Ser. No. 492,391, Jul. 29, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 605,001
Int. Cl.[2] A63B *69/00*
U.S. Cl. 273—54 B **1 Claim**

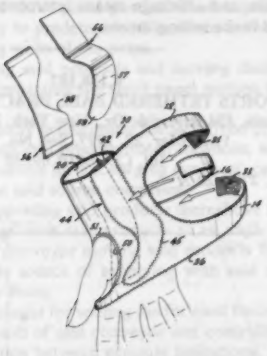
1. A hand/wrist positioner for bowling comprising:
(a) a band of flexible material adapted to wrap about the

hand and wrist of a bowler and having a first edge extending to the plam of the hand and across the back of the hand and a second edge extending about the wrist, said band including an aperture therethrouugh substantially adjacent said first edge for receiving the thumb of the bowler;

(b) a first pocket formed in said band and aligned on a first side of the aperture to extend over the back of the hand and the back of the wrist said first pocket opening along the second edge;

(c) a second pocket formed in said band and aligned on the opposite side of the aperture from said first pocket, said second pocket adapted to extend along the inside of the wrist and palm, said second pocket opening along the second edge;

(d) a first stiffener disposed within said first pocket, said first stiffener comprising first and second members being inte-



gral with each other and defining an oblique angle therebetween, said first and second members adapted to lie adjacent the back of the hand and wrist respectively and to maintain an angle between the back of the hand and wrist equal to said oblique angle;

(e) a second stiffener disposed within said second pocket, said second stiffener having a first substantially planar section adapted to lie adjacent the inside of the wrist, said first section depending into a narrowing second section, said second section being contoured downwardly from the plane of said first section and then depending upwardly to lie in the palm of the hand adjacent the thumb, said second section extending into an end portion which curves toward the thumb and towards the center of the palm; and

(f) means for securing said band about the hand and wrist of the bowler.

4,138,109

RACKET AND THROAT PIECE THEREFOR

John W. Nobbs, Alloways, Ewhurst, Surrey, England

Filed Mar. 14, 1977, Ser. No. 776,834

Claims priority, application United Kingdom, Mar. 17, 1976, 10631/76

Int. Cl.[2] A63B *49/00*

U.S. Cl. 273—73 G **10 Claims**

1. A game racket comprising:

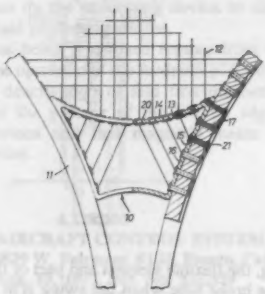
(a) a first member shaped symmetrically to form a substantially circular or elliptical frame portion and a pair of symmetrical shafts,

(b) a hollow frame-like second member of metal serving as a throat-piece of which one wall completes in combination with said frame portion a striking area,

(c) said throat-piece having side walls having outer surfaces formed complementary to said symmetrical shafts which they engage,

(d) said one wall, said side walls, said frame portion, and said shafts in the region of the throat-piece having apertures therein, the apertures in said side walls being in alignment with the apertures in the shafts, and

(e) strings comprising longitudinal strings and transverse strings extending across said striking area, the central



longitudinal strings passing through said apertures in said one wall, side walls and said shafts to hold said throat-piece in compression between said shafts, said strings in the throat area being the sole means of retaining the throat-piece in place.

4,138,110

KICKER APPARATUS FOR TABLE GAME

Richard L. Hendrickson, 1821 N. 11th St., Bismarck, N. Dak. 58501

Filed Oct. 5, 1977, Ser. No. 839,432

Int. Cl.[2] A63F *7/08, 7/10*

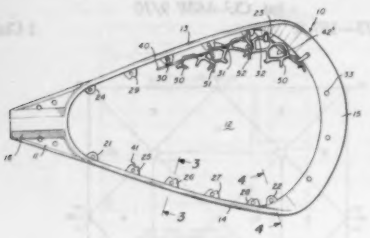
U.S. Cl. 273—85 D **15 Claims**

9. For being mounted on a horizontally elongated actuating rod of a table game, a kicker member comprising a head element, a kicker element removably mounted on the head element and means for removably securing the head element to the kicker element, the head element including a lower portion having spaced leg portions that have adjacent surfaces and remote outer surfaces opposite their adjacent surfaces, and a downwardly facing surface of a shape to substantially form a mating fit with the upper part of the rod and defining at least part of the adjacent surfaces of the above leg portions, and the kicker element having a lower portion and spaced legs joined thereto to extend thereabove, the kicker element legs having adjacent surfaces of a shape to form a substantially mating fit with at least pa.ts of the head element legs outer surfaces.

4,138,111
LACROSSE STICK WITH PERIPHERALLY GROOVED SUPPORT TABS

Robert J. Rule, Manhasset, N.Y., assignor to W. H. Brine Co., Needham, Mass.

Filed Mar. 4, 1977, Ser. No. 774,450
Int. Cl.[2] A63B 59/02
U.S. Cl. 273—96 D 2 Claims



1. In a lacrosse stick head having an enclosing support frame comprising two side walls and an end wall defining an opening within which is mounted a net having a ball pocket, wherein said net is mounted on a lacing string which is in turn mounted on spaced support tabs extending from the sides inward into said opening having holes therein for passage of said lacing string,

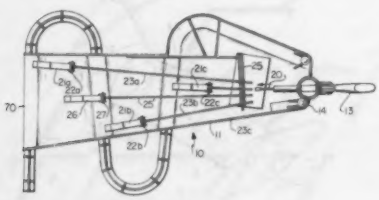
the improvement comprising,

locating means carried by said tabs and acting to prevent movement of said lacing string when it passes through said hole and is looped and tied over said locating means each of said locating means on said spaced support tabs on said side walls includes a peripheral groove extending generally parallel to said hole.

4,138,112
MOVING TARGET GAME WITH IMPACT DEVICE

Raymond J. Lohr, 5043 Sterrettania, Erie, Pa. 16506

Filed Jul. 5, 1977, Ser. No. 812,703
Int. Cl.[2] A63F 9/02; F41J 9/00
U.S. Cl. 273—101.2 12 Claims



8. A target game comprising,

an inclined track having a top thereon,

means for movably supporting a target on said track to run down said track by gravity,

a gun mounted on one end of said track and means on said gun for permitting movement thereof in both azimuth and elevation,

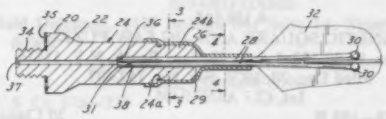
means extending through said track for engaging said target when said target is over said means for engaging said target during said target's movement down said track,

impact means on said gun adapted to engage said means extending through said track for impacting said means extending through said track and causing engagement of said means extending through said track with said target.

4,138,113
DART FLETCHING ASSEMBLY

Walter M. Sheldon, Jr., Deerfield, Ill., assignor to Fansteel Inc., North Chicago, Ill.

Filed Jun. 9, 1977, Ser. No. 804,947
Int. Cl.[2] A63B 65/02
U.S. Cl. 273—106.5 C 4 Claims



1. A dart flight assembly of the type to be secured the aft end of a dart body which comprises:

(a) a fletching body section having means to secure the fore-end of the section to the aft end of a dart body,

(b) said section having an axial recess in the aft end thereof terminating at a defined shoulder at a blind end,

(c) a plurality of at least three pins having a high modulus of elasticity each having a fore-end inserted in said section recess against said shoulder and each having an aft end extending from said recess, said pins being in close contact with each other,

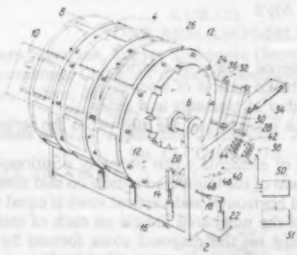
(d) a heat shrinkable tube overlying a portion of said body section and a portion of said pins to hold said pins in close contact with each other, and

(e) a fletching assembly having a plurality of blades held at the roots of the blades between said pins.

4,138,114
SLOT MACHINES

Kurt H. Andersen, Gertrud Rasks Vej 3, 8200 Aarhus N, Denmark

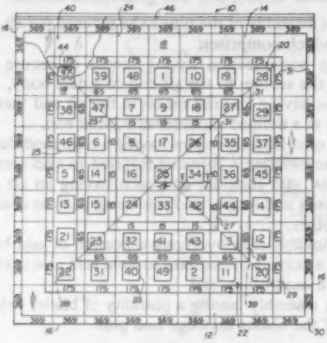
Filed Oct. 1, 1974, Ser. No. 510,993
Int. Cl.[2] A63F 5/04
U.S. Cl. 273—143 R 7 Claims



1. A machine comprising: a chassis, a plurality of rotary indicator members, a shaft means for rotatably supporting said plurality of indicator members mounted in said chassis, each of said indicator members being provided with an annular row of symbols, actuator means for starting the indicator members to rotate individually, stop means for stopping the rotation of the respective indicator members, a position indicator means associated with each indicator member for providing an indication of the respective stop positions of the indicator members, detector means associated with each of said indicator members for selectively detecting the respective indicator means of the indicator members thereby indicating the actual stop position of a respective indicator member, a further indicator means for indicating the occurrence of a predetermined combination of symbols on the respective indicator members in the stopped position, logic control means connected with said detector means and said further indicator means for providing a control output signal to said further indicator means in response to said

detector means detecting the predetermined combination of symbols, said annular row of symbols being provided on a carrier of sheet material, said sheet material carrier forming an independent element removably secured to the respective indicator members, said indicator means for indicating the respective stop positions of the indicator members being provided on said sheet material carrier.

4,138,115
MAGNETIC SQUARE AND JIG SAW PUZZLE
Ernest Gans, 84-39 153rd Ave., Howard Beach, N.Y. 11414
Filed Dec. 20, 1976, Ser. No. 752,407
Int. Cl.² A63F 9/06
U.S. Cl. 273—153 R **20 Claims**



19. A jig saw puzzle number problem game, which comprises:

A. a plurality of individual elements with each element having a different numbered indicia thereon, said elements being arrangeable to form an odd number of squares arranged in an equal number of horizontal and vertical rows intersecting each other to satisfy a predetermined value which is satisfied by the mathematical formula:

$$X = [\sqrt{n}\,(a + N)]/2$$

wherein:
a = first numbered indicia of a series
N = last numbered indicia of a series
n = total number of elements in a series
$\sqrt{n}$ = being an integer, and the interval in the series is a constant

B. said plurality of elements when properly positioned are such that the sum of the numbered indicia on said elements on each of said horizontal and vertical rows is equal to X, and the sum of the numbered indicia on each of said elements positioned on the diagonal rows formed by said squares is also equal to the sum specified by X,

C. a border surrounding the perimeter of said squares and having indicium thereon equivalent to said predetermined value of X,

D. retaining means for releasably securing said individual elements in interlocking relationship to each other,

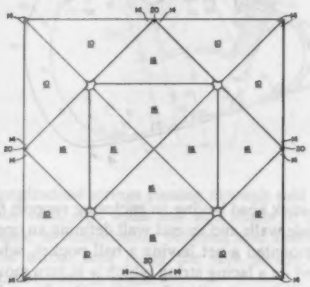
E. said retaining means includes a protrusion on certain of said elements and a recess on other of said elements so as to obtain an interlocking relationship with respect thereto and the solution to the puzzle is not solvable merely by said interlocking relationship of said elements alone

F. solution means adapted to be operatively positioned on the assembled elements such that a quick determination can be made if a proper solution to the puzzle number problem gas has been obtained,

G. said solution means including a sheet having positioned thereon the correct numerals for the puzzle number problem game, said numerals extending in overlapping relationship to a respective one of said elements, and

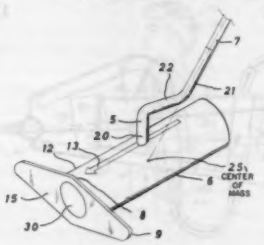
H. coupling means for removably securing said sheet to the puzzle number problem game along substantially one end thereof.

4,138,116
PUZZLE ASSEMBLY
Worthy G. Siders, Jr., 4305 Garrett Park Rd., Silver Spring, Md. 20906
Filed Nov. 8, 1977, Ser. No. 849,716
Int. Cl.² A63F 9/10
U.S. Cl. 273—157 R **2 Claims**



1. A puzzle assembly solved as a planar square consisting of sixteen congruent isosceles right triangular pieces, each of said pieces having a predetermined number of corners which are rounded in a predetermined, patterned manner with the remaining corners being sharp whereby the solved puzzle is a square having perfectly smooth, uninterrupted side edges and sharp corners.

4,138,117
GOLF CLUB HEAD
John A. Dalton, 166 Booran Rd., Glenhuntly, Victoria, Australia (3163)
Filed Sep. 15, 1976, Ser. No. 723,445
Int. Cl.² A63B 53/04
U.S. Cl. 273—164 **8 Claims**



8. In a golf putter comprising a head having a strike face, a shaft and a connector member attaching the shaft to the head, the improvement wherein:

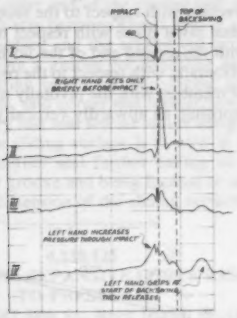
said shaft is straight with an extension of the axis thereof passing through the center of mass of the head; and

said connector member has a first portion connected to the head such that an extension of the axis of said first portion passes through the center of mass of the head, said first portion extending upwardly from the head vertically when the strike face of the head is vertical, a second portion offset from the first portion and connected coaxially to the shaft, and an offsetting portion connecting said first and second portions.

4,138,118
GOLF CLUB GRIP TRAINING DEVICE

David R. A. Budney, 65 Alexander Parade, Charlestown, N.S.W., Australia

Filed Jun. 2, 1977, Ser. No. 802,795
Claims Priority, Application Australia, Jun. 11, 1979, 62 37/76
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—183 D 7 Claims

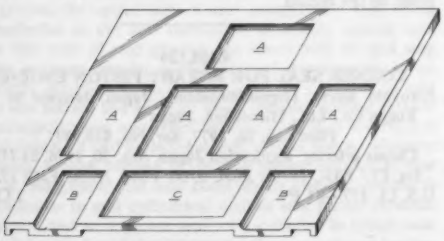

IMPACT
TOP OF BACKSWING
RIGHT HAND ACTS ONLY BRIEFLY BEFORE IMPACT
LEFT HAND INCREASES PRESSURE THROUGH IMPACT
LEFT HAND GRIPS AT START OF BACKSWING THEN RELEASES

1. A golf club having a handle and a head, a first pressure sensitive transducer on the handle and positioned to sense the pressure exerted by a pincer finger action applied by one hand of a golfer, a second pressure sensitive transducer on the handle and positioned to sense the pressure exerted by a grip action applied by the other hand of a golfer, read-out means separate from the golf club, electrical signal transmission means linking each of the transducers to the read-out means, and means associated with the read-out means for providing a visual time-based display of a signal representative of pressure changes sensed by each of the transducers when the golfer executes a stroke.

4,138,119
CARD-TYPE GAME AND APPARATUS FOR PLAYING SAME

Jeanetta H. Brannon, 618½ E. 97th St., Inglewood, Calif. 90301

Filed Nov. 21, 1977, Ser. No. 853,081
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—236 9 Claims

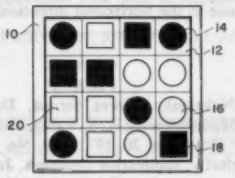


1. A game apparatus, which comprise:
(a) a first deck of playing cards, having a plurality of suits, in which each suit contains cards bearing the same sequential numbers and cards bearing the same alphabetic letters;
(b) a second deck of cards, having a plurality of suits and in which each suit contains cards designating various monetary denominations;
(c) chance means for selecting one monetary amount from multiple possibilities;
(d) a plurality of simulated money bills of various monetary combinations corresponding to the monetary denominations displayed on the individual cards of the second deck; and
(e) a playing board having a plurality of first designated locations for receiving cards from the first deck of playing cards, a second designated location for receiving the second deck of playing cards, a third designated area for receiving the chance means, and a fourth designated location for receiving the simulated money bills.

4,138,120
BOARD GAME

Reid Daitzman, 1425 Bedford St., Suite 1A, Stamford, Conn. 06905

Filed Jun. 15, 1977, Ser. No. 806,756
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—271 2 Claims

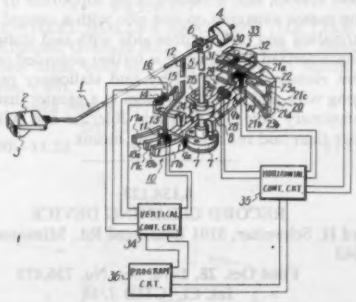


1. A board game comprising: a game board, said board being divided into an even number of spaces arranged in a regular rectangular array; a plurality of playing pieces, the number of playing pieces being equal to the number of spaces, said playing pieces being divided into four sets, the playing pieces within each set being substantially identical to each other and the number of playing pieces in each set being equal to the number of playing pieces in each of the other sets; the playing pieces of the first and second sets being of the same color but of different shape; the playing pieces of the first and third sets being of the same shape but of different color; the playing pieces of the second and fourth sets being of the same shape but of different color, and the playing pieces of the third and fourth sets being of the same color but of different shape.

4,138,121
TONE ARM ASSEMBLY

Heitaro Nakajima, Tokyo; Yoshimoto Omura, Mitaka, and Isao Kawashima, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 22, 1977, Ser. No. 790,047
Claims priority, application Japan, Apr. 28, 1976, 51/48937
Int. Cl.[2] G11B *3/10*
U.S. Cl. 274—23 R 23 Claims



1. A tone arm assembly for controlling the tracing of a tone arm across a record disc and for preventing resonance of said tone arm, comprising a tone arm having a cartridge at one end thereof; first motor means mechanically coupled to said tone arm for moving said tone arm in the vertical direction with

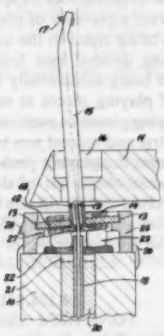
respect to said record disc; second motor means mechanically coupled to said tone arm for moving said tone arm in the horizontal direction with respect to said record disc; detecting means for detecting low frequency resonance in said tone arm in the vertical and horizontal directions as said tone arm traces said record disc; drive means coupled to said first and second motor means for supplying drive signals to said motor means to control the movements of said tone arm; and feedback means coupled to said detecting means for feeding back a vertical compensating signal to said drive means so as to compensatingly drive said first motor means in opposition to said detected low frequency resonance and thereby cancel said resonance in the vertical direction in said tone arm, and for feeding back a horizontal compensating signal to said drive means so as to compensatingly drive said second motor means in opposition to said detected low frequency resonance and thereby cancel said resonance in the horizontal direction in said tone arm.

4,138,122

PICKUP

Hisayoshi Nakatsuka, Greve Strand, Denmark, assignor to Ortofon Manufacturing A/S, Valby, Denmark

Filed Jun. 20, 1977, Ser. No. 808,163
Claims priority, application Denmark, Jun. 22, 1976, 2802/76
Int. Cl.[2] G11B *3/46*
U.S. Cl. 274—37 **5 Claims**



1. A pickup of the type having a stationary pole leg with one end of a wire secured thereto and the other end affixed to the movable system of the pickup, comprising a stylus arm having a stylus affixed at the front end and the other end of said wire affixed to the rear end and also having an armature secured to the rear end of said stylus arm for defining a fulcrum of said movable system, said armature being supported by a resilient bearing means engaging on one side with a central portion of said armature and on the other side with said stationary pole leg, characterized in that there is further provided one or more resilient elements supported by said stationary pole leg for engaging with said movable system at a greater distance from said stationary pole leg than said fulcrum and with a lower pressure than said resilient bearing means.

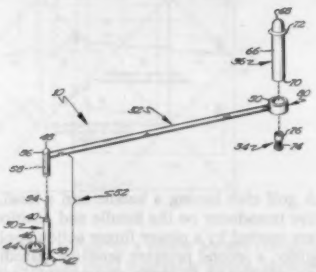
4,138,123

RECORD CLEANING DEVICE

Eduard H. Schweizer, 5101 Boarshead Rd., Minnetonka, Minn. 55343

Filed Oct. 28, 1976, Ser. No. 736,473
Int. Cl.[2] G11B *3/58*
U.S. Cl. 274—47 **6 Claims**

1. Record cleaning device for use with a turntable platter allowing the placement of a record having grooves thereon in a preset orientation comprising, in combination: a member arranged vertically with respect to the record orientation having a first end and a second end; means arranged for attaching the first end of the vertical member to a stationary point with respect to the turntable platter; a member arranged horizontally with respect to the record orientation having a first end and a second end; means for pivotally mounting the first end of the horizontal member to the second end of the vertical member for pivoting the horizontal member within a horizontal pivot plane with respect to the record orientation at a single, preset vertical spacing with respect to the record orientation from the first end of the vertical member and for holding the horizontal member in a rigid manner from pivoting in a vertical direction with respect to the record orientation out of the horizontal pivot plane with respect to the record orientation and with the second end of the horizontal member being spaced horizontally with respect to the record orientation from the vertical member; with the pivotally mounting and holding means comprising, an upwardly vertically directed pivot shaft



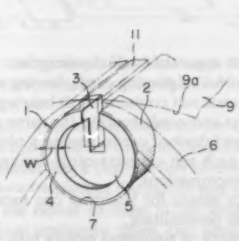
attached to the second end of the vertical member, and a pivot boss attached to the first end of the horizontal member and having a vertically downwardly directed cavity formed therein for receiving the pivot shaft such that the pivot boss rests upon and is supported by the second end of the vertical member and the pivot shaft is located within the pivot cavity; a brush; a brush holder including means for receiving the brush; means for slidably and adjustably vertically mounting the brush holder to the second end of the horizontal member wherein the device can be positioned adjacent to the turntable platter such that the brush can be placed on the record to follow the grooves inwardly of the record as the platter revolves, and can be used when the level of the record top surface changes thus allowing different vertical heights of the brush, and transfers only the weight of the brush holder and brush to the record.

4,138,124

CORNER SEAL FOR ROTARY PISTON ENGINES

Niroyuki Kurio, Higashihiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Sep. 16, 1977, Ser. No. 833,957
Claims priority, application Japan, Sep. 20, 1976, 51-113460
Int. Cl.[2] F01C *19/00*; F03C *3/00*; F04C *27/00*; F16J *15/16*
U.S. Cl. 277—81 P **3 Claims**



1. Rotary piston engine comprising a casing having an inner peripheral wall and a pair of inner side walls; a rotor disposed in said casing and having apex portions adapted to be slidably

engaged with said inner peripheral wall of the casing, said rotor having a pair of side surfaces opposing to said inner side walls of the casing; said rotor having recesses in the vicinity of the apex portions in each of the side surfaces; and a corner seal received in each of the recesses and having an outer end adapted to be brought into sliding contact with one of the inner side walls of the casing at least under the influence of gas pressure introduced into said recess, said corner seal being formed at the outer end with a second recess leaving a sliding end surface on said outer end of the corner seal, said sliding end surface having an area between 45 and 75% of a sum of the area of the sliding surface and the area of the second recess, said corner seal having a groove for receiving an end of an apex seal and providing means for introducing gas pressure into the second recess, said corner seal further having a cylindrical outer periphery and said second recess being of a circular shape so that the sliding surface is formed in an annular configuration, said corner seal further having an axial bore contiguous with said groove and being located so as to locally decrease the radial dimension of the sliding surface.

4,138,125

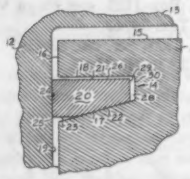
PISTON RING WITH EXPANSIVE FORCE RESPONSIVE TO PRESSURE

William J. Lucas, 2347 38th St., Rock Island, Ill. 61201

Filed Jan. 2, 1975, Ser. No. 537,904

Int. Cl.[2] F16J *9/20*

U.S. Cl. 277—170 **1 Claim**



1. A piston and ring assembly comprising: a piston having a peripheral groove in the upper portion of the cylindrical wall thereof, the upper side wall of said groove being perpendicular to said cylindrical wall, the lower side wall of said groove spaced from said upper side wall and slanted downwardly in an outwardly direction at an acute angle with respect to the direction of said upper side wall, a compression ring within said groove, the upper side of said compression ring being perpendicular to the axis thereof to fit evenly against said upper side wall of said groove, the lower side of said ring having an inner circular portion slanted downwardly in an outwardly direction at said acute angle with respect to said upper side thereof and an outer lower circular portion extending outwardly from said inner circular portion in a direction perpendicular to said cylindrical wall of said piston, whereby said inner circular portion fits evenly against said lower side wall of said groove and said outer lower circular portion is perpendicular to said cylindrical wall of said piston between said piston and an adjacent wall of a cylinder in which said piston is installed, said ring having moderate expansive tension for pressing the circumferential side of said compression ring against the wall of a cylinder in which said piston and ring assembly is installed, the dimensions of said ring relative to the dimensions of said groove being chosen to provide spacing between the inner circular wall of said ring and the inner wall of said groove and spacing along at least one side of said ring sufficient to transfer rapidly pressure from fluid adjacent the outer portion to said ring to said spacings, said ring having sufficient radial thickness to provide substantial downward force on said upper side of said ring from pressure developed in said cylinder, said acute angle being between 2 degrees and 30 degrees according to the requirements of a cylinder in which said piston and ring assembly is used, the angle being chosen to increase outward radial force on said ring resulting from downward pressure of fluid on said upper side of said compression ring to the extent required to maintain said circumferential side pressed against said wall of said cylinder during operation, said compression ring having a step joint for a ring gap, the line of the split of said step joint as veiwed in cross section being between a point somewhat below the upper outer corner of said compression ring to a point on said lower side a short distance from said inner circular wall.

4,138,126

ADJUSTABLE PACKING ASSEMBLY

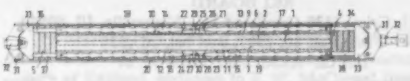
Andreas Jaudt, Schongauerstrasse 10C, D-8900 Augsburg, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,975

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1977, 2746956

Int. Cl.[2] F16K *27/04, 3/02;* F16J *15/16*

U.S. Cl. 277—191 **12 Claims**



1. An adjustable packing assembly for creating a fluid-tight sliding connection with a slide-valve control member, said assembly comprising:

a hollow housing including a pair of through slots formed in opposite side walls of said housing, with said through slots of a sufficient size to allow said control member to pass therethrough;

a plurality of packing members positioned within said housing and surrounding said control member, with at least one packing member in adjustably, abutting contact with each surface of said control member;

stationary wedging means positioned within said housing for providing adjustable pressure against those packing members contacting the side surfaces of said control member;

movable wedging means positioned within said housing and in sliding contact with said stationary wedging means; and

means responsive to selective movement of said movable wedging means for adjusting the bearing pressure between said packing members and said control member, with said responsive means applying a uniform bearing pressure against the entire surface of said packing members.

4,138,127

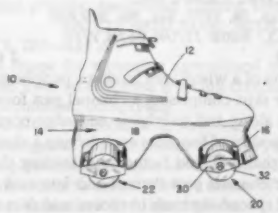
TWO WHEEL ROLLER SKATE OR THE LIKE

Steven D. Kimmell, Granada Hills, and Benjamin H. Stansbury, Jr., Beverly Hills, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 8, 1977, Ser. No. 849,549

Int. Cl.[2] A63C *17/02*

U.S. Cl. 280—11.23 **11 Claims**



1. In a rider supporting device, such as a roller skate, skateboard or the like, the combination comprising:

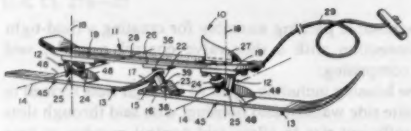
a rider supporting member having a longitudinal center line extending generally in the direction of travel thereof;

at least one cradle member;

a wheel rotatably mounted to said cradle member for rotation about an axis with said wheel being adapted for engaging a surface; and

means for mounting said cradle member to said rider supporting member for pivoting about an axis extending generally in the direction of said longitudinal center line, said cradle pivoting axis being angularly disposed relative to said surface and generally intermediate said wheel axis and said surface with said wheel axis extending in a direction generally perpendicular to said cradle pivoting axis, said cradle pivoting axis defining a steering axis for providing rotation of said wheel axis relative to said longitudinal center line whereby to steer said device.

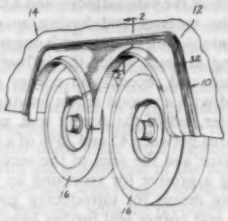
4,138,128
SKI BOARD
William H. Criss, 1130 Candlenut Dr., Naperville, Ill. 60540
Filed Feb. 10, 1977, Ser. No. 767,536
Int. Cl.[2] A63C *5/00*; B62B *13/04*
U.S. Cl. 280—16 **11 Claims**



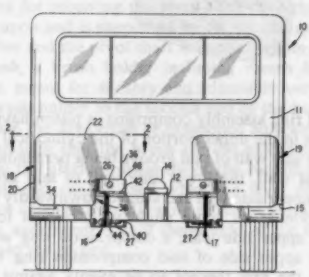
1. A ski board comprising an elongated riding platform, a pair of mounting brackets attached to the underside of said riding platform in longitudinally spaced relationship, each of said mounting brackets including means permitting pivotal movement of said mounting bracket about a horizontal and a vertical axis relative to said riding platform, a ski having a curved tip and a planar rear edge attached to each of said mounting brackets in a normal longitudinally aligned position to define a leading ski and a trailing ski wherein said tip of said trailing ski slightly overlaps said rear edge of said leading ski, each of said skis including means permitting pivotal movement of said ski about a horizontal axis relative to said mounting bracket, and means for joining said rear edge of said leading ski to said tip of said trailing ski including a resilient disc and a ski-joining bolt extending therethrough, said joining means limiting pivotal movement of said skis about said horizontal and vertical axes by exerting a force tending to restore said skis to said normal longitudinally aligned position whereby said trailing ski will track said leading ski over uneven terrain.

4,138,129
VEHICLE WHEEL WELL SKIRT
William D. Morris, South Bend, Ind., assignor to American Formed Plastics Corp., Elkhart, Ind.
Filed Jun. 24, 1977, Ser. No. 809,610
Int. Cl.[2] B60R *13/04*; B62B *9/16*
U.S. Cl. 280—152 R **3 Claims**

1. The combination of a wheel well having a peripheral edge portion and a fender skirt comprising a channel part formed in said skirt extending along and overlying said edge portion of the wheel well, a plurality of fasteners each having a shank and enlarged head, the shank of said fasteners extending through said skirt within the channel part thereof and into said wheel well edge portion at spaced intervals to secure said skirt to said wheel well with the heads of said fasteners overlying said skirt at its channel part, a strip of deformable flexible cellular tape fitted within said channel part and overlying said fastener heads, means securing said tape to said channel part with the fastener heads deforming said tape whereby said tape in conjunction with said channel part hides said fasteners from exterior view.



4,138,130
SHIELD ASSEMBLY FOR TOWED TRAILER
James M. Pickrell, Rt. 3, Box 1129, and Floyd V. Pate, 709 Placer, both of Odessa, Tex. 79763
Filed Sep. 26, 1977, Ser. No. 836,397
Int. Cl.[2] B62D *25/16*
U.S. Cl. 280—154.5 R **5 Claims**



1. In a trailer of the type which is towed and which has a forwardly disposed A-frame for attachment to a towing vehicle, the combination with said trailer of a shield assembly by which the forward end wall of the trailer is protected from debris thrown by the towing vehicle;

said shield assembly includes a plate and a bracket assembly for each leg of said A-frame, with the plate and bracket assembly of one leg being a mirrow image of the plate and bracket assembly of the other leg;

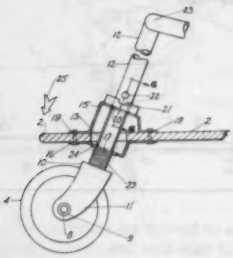
each said bracket assembly having downwardly disposed members which are affixed to a leg of said A-frame, and further includes upwardly disposed spaced guide members; said guide members being parallel to one another and to said plate; said plate having a marginal surface thereof received within said guide members, means by which said plate is removably attached to said bracket assembly;

so that said plate, bracket assembly, A-frame, and forward end wall can be arranged respective to one another to dispose said plate parallel to the forward end wall at a location superimposed in advance of a lower marginal outer wall surface thereof and in the path of air borne debris emitted by the rear wheels of the towing vehicle.

4,138,131
OCCUPANT WEIGHT ACTUATED STEERING UNLOCKING MECHANISM FOR WHEELED VEHICLES AND THE LIKE

Frederick A. Sommer, 4238 Sibley Ave., Cincinnati, Ohio 45236

Filed Mar. 21, 1978, Ser. No. 888,698
Int. Cl.² B62K 9/00
U.S. Cl. 280—220 8 Claims



1. In a wheeled vehicle of the type having a weight supporting section and a steering post associated with the weight supporting section mounting at least one guide wheel for steering the vehicle, the improvement in combination therewith comprising a weight acutated steering unlocking mechanism including:

a. bearing support means affixed to said supporting section for slidingly receiving and pivotally guiding said steering post;

b. means in association with said steering post and said bearing support means for providing pivotal movement of said steering post with respect to said bearing support means only when a predetermined downward force is applied to said supporting section, said movement providing means comprising first locking means nonrotatably secured to said steering post, second locking means nonrotatably secured to said bearing support means and spring means for urging said first and second locking means into intermeshed engagement to prevent relative rotational movement between said steering post and said bearing support means when a downward force less than said predetermined force is applied to said supporting section, a downward force of at least said predetermined force causing said bearing support means to slidingly advance along said steering post to bring said first and second locking means out of intermeshed engagement to permit relative rotational movement between said steering post and said bearing support means.

4,138,132
PROTECTIVE COVERS FOR MOTORCYCLE LOWER FORK CASES AND METHOD OF MAKING SAME

Keith H. Doyle, 10758 133rd Ave. E., Puyallup, Wash. 98371

Filed Apr. 20, 1977, Ser. No. 789,182
Int. Cl.² B62J 23/00
U.S. Cl. 280—289 G 9 Claims

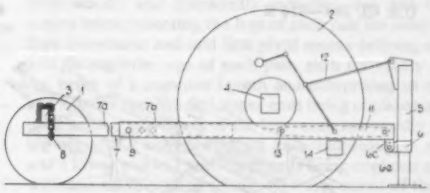
1. A removable protective cover for fork cases on motorcycles to prevent damage to the cases and provide an attractive appearance, comprising, a hollow flexible tubular sleeve of a non-rigid material having an open top end and a bottom end and being matingly contoured to the shape of the lower fork case for coextensive face to face contact therewith and means defining a slit through its surface to permit installation and removal of the sleeve, said slit extending longitudinally along the sleeve for substantially its full length but terminaing short of said bottom end to thus form essentially an elongate, one-piece tube split along its length, with an integral collar at said bottom end below the termination of the slit whereby after installation on a motorcycle fork case a cover protecting the fork case and its lower terminal end is provided which is not

easily removed, to thereby assure its retention on the fork and discourage theft.

4,138,133
VEHICLE WEIGHT TRANSFER MECHANISM

Leslie A. Brown, Tenbury Well, and Harry W. Norton, Ludlow, both of England, assignors to F. W. McConnel Limited, Ludlow, England

Filed Apr. 19, 1977, Ser. No. 788,974
Int. Cl.² B60D 1/00
U.S. Cl. 280—405 B 11 Claims



1. A weight transfer mechanism for a towing vehicle and a machine to be towed comprising a lifting device, a weight transfer member adapted to be coupled to the lifting device and to be supported for generally vertical pivotal movement with respect to the vehicle, first abutment means connected to said member, and second abutment means on the vehicle, the arrangement being such that with the machine connected to the member and said first and second abutment means in engagement to prevent relative lifting between the machine and the vehicle operation of said lifting device causes the machine and vehicle to be lifted together as a unit through the intermediary of said member.

4,138,134
FOLDING HARROW FRAME

Friedrich W. Lechler; Edwin F. Lechler, and Herbert A. Lechler, all of Box 2, Middle Lake, Saskatchewan, Canada

Filed Dec. 21, 1977, Ser. No. 862,777
Claims priority, application Canada, Dec. 22, 1976, 268505
Int. Cl.² B62D 53/00; A01B 73/00
U.S. Cl. 280—411 A 12 Claims

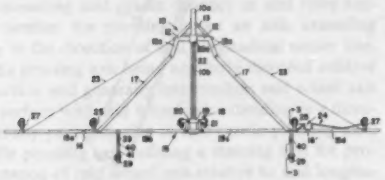
1. A frame for mounting agricultural implements, which is foldable from an extended working condition to a folded travelling condition, comprising:

a draw bar connectable at its front end to a tractor vehicle,

an elongated support beam for carrying said agricultural implements, said beam having two side portions pivotably connected to each other at a center of the beam for folding movement in a horizontal plane,

two links, each pivotably connected at a front end to said draw bar and at a rear end to a central part of a respective beam portion, and

means connecting the center of the beam to the draw bar, said connecting means allowing the center of the beam to be held so spaced from the front end of the draw bar that the beam is extended with its side portions substantially aligned with each other, and said connecting means also



allowing movement of the center of the beam in a fore and aft direction relative to the draw bar to cause folding of the beam portions about the rear ends of the links, whereby in the folded condition the beam portions extend substantially parallel to the draw bar.

4,138,135

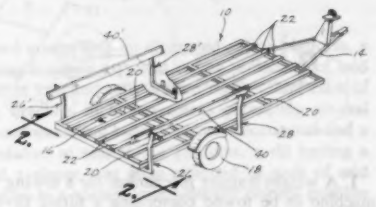
BOAT TRAILER

Johnnie D. Hewitt, Rte. 1, Box 227, Farmington, Ark. 72730

Filed Sep. 8, 1977, Ser. No. 831,614

Int. Cl.[2] B60P *3/10*

U.S. Cl. 280—414 R **4 Claims**



1. A boat trailer comprising,

a wheel frame means having rearward and forward ends and opposite sides,

said frame means having a forwardly extending tongue for connection to a prime mover,

a boat support means on said frame means between the opposite sides thereof for supporting the bottom portion of a boat,

at least first and second spaced apart arms pivotally secured to said frame means at one side thereof, said first and second arms having upper ends disposed above said boat support means,

a first guide rail secured to and extending between said first and second arms adjacent said upper ends for engagement with one side of a boat,

resilient means connected to said first and second arms for yieldably urging said first guide rail into engagement with said one side of the boat,

at least third and fourth spaced apart arms pivotally secured to said frame means at the other side thereof, said third and fourth arms having upper ends disposed above said boat support means,

a second guide rail secured to and extending between said third and fourth arms adjacent said upper ends for engagement with the other side of a boat,

resilient means connected to said third and fourth arms for yieldably urging said second guide rail into engagement with said other side of the boat.

4,138,136

SKI BRAKE

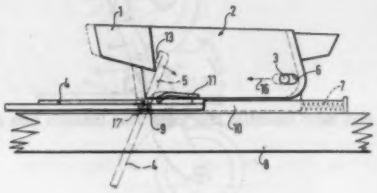
Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy Haute-Savoie, France

Filed Aug. 9, 1976, Ser. No. 712,958

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1975, 2535552

Int. Cl.[2] A63C *7/10*

U.S. Cl. 280—605 **7 Claims**



1. In combination:

a ski having an upper surface and a lower surface and forward and rearward ends;

a boot clamp mounted on said ski and pivotally displaceable thereon about a clamp axis generally parallel to said surfaces between a holding position securing a skiboot to said ski and a release position in which said skiboot is freed from said ski by said clamp;

an elongated brake element pivotal on said ski about a brake axis generally parallel to said surfaces between a braking position extending generally normal to the planes of said surfaces of said ski and projecting beyond said lower surface of said ski and a retracted position extending generally parallel to said ski and lying generally above said lower surface of said ski, whereby in said braking position said element can dig into snow under said ski to brake same; and

means including a rigid brake abutment fixedly mounted on said brake element and a rigid clamp abutment fixedly mounted on and extending laterally from said clamp in a direction generally perpendicular to the longitudinal axis of said ski and generally parallel to said upper surface thereof, and directly engageable with said brake abutment for displacing said brake element from said retracted into said braking position on displacement of said clamp from said holding into said release position.

4,138,137

SKI BRAKE

Jean J. A. Beyl, 10 Boulevard Victor Hugo, Nevers, Nièvre, France

Filed Mar. 17, 1977, Ser. No. 778,479

Claims priority, application France, Mar. 26, 1976, 76 08849

Int. Cl.[2] A63C *7/10*

U.S. Cl. 280—605 **5 Claims**

1. A ski brake of the type adapted to be mounted on a ski and controlled either by the presence or absence of a ski boot or ski binding plate, comprising a pair of rigid braking members disposed on either side of the ski, means pivotally supporting said braking members for vertical movement, mounted transversely of said ski, a brake control pedal positioned on the upper surface of the ski comprising a rigid bow-shaped member having a bow portion positioned above the upper surface of the ski and engageable by the ski boot or ski binding plate, and a pair of side arms respectively rigidly attached to said braking members, spring means normally urging said pedal upwardly and the attached braking means downwardly into a ski-braking position, said spring means comprising a resilient metal wire loop, means pivotally and transversely mounting one side of said loop on said ski, longitudinally displaced

thereon relative to the pivotal mounting of said braking members, and means attaching the opposite side of said loop to the bow portion of said control pedal, whereby when said control pedal is depressed by the pressure of the ski boot or ski binding

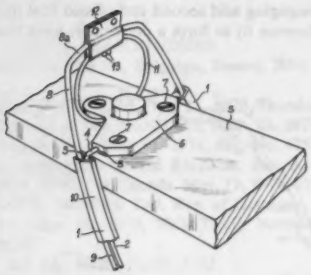
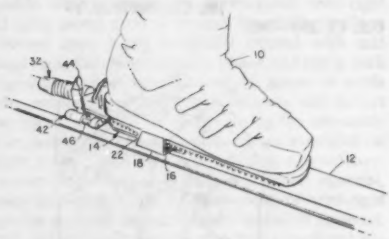


plate said braking means are moved to a substantially horizontal nonbraking position and said wire loop is distorted to provide a return spring action when said pressure is removed to effect a downward braking position of said braking means.

4,138,138
SNOW SKI BRAKE
Peter K. Grossmann, 15304 NE. 6th Pl., Bellevue, Wash. 98007
Filed Oct. 11, 1977, Ser. No. 840,608
Int. Cl.[2] A63C *7/10*
U.S. Cl. 280—605 **5 Claims**



1. A snow ski brake to be mounted on a snow ski binding in turn mounted on a snow ski for immediate actuation to stop an otherwise runaway ski from sliding downhill after a ski has been released from a skier's safety automatic release binding, comprising:

(a) a base extending both transversely and longitudinally on a snow ski, having bearing support portions and fastener receiving portions;

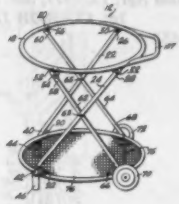
(b) an integral braking arm assembly including a hollow braking arm hub, a braking arm, and a latching arm at a right angle to the braking arm;

(c) a shaft rotatable in the bearing support portions of the base and passing through the hollow braking arm hub of the braking arm;

(d) a coiled spring around the shaft and secured between the hollow braking arm hub and the base to rotatably force the integral braking arm assembly into a ski braking position, wherein the braking arm rotates in a geometric plane which is perpendicular to the base and also to a ski, rotating through approximately 180° from an upward vertical position out of the snow to a downward vertical position in the snow, and the integral latching arm rotates in a geometric plane which is perpendicular to the base and also to a ski, rotating through approximately 180° from a horizontal position adjacent the base and just above the ski, to a horizontal position away from the base and ski; and

(e) a catch means mounted to the base to keep the latching arm in a horizontal position over the ski and thereby to keep the braking arm in its upward non-braking position, until a ski boot is inserted into a ski binding, with the ski boot thereafter causing the retention of the latching arm, until the ski boot under an abnormal force is released from a skier's safety automatic release binding.

4,138,139
COLLAPSIBLE TRASH CARRIER
Berta C. Alfonso, 9835 SW. 53 Terr., Miami, Fla. 33165
Filed Dec. 22, 1977, Ser. No. 863,123
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—652 **5 Claims**



1. For use with a disposable plastic trash bag having a mouth zone and a bottom, a wheeled collapsible trash carrier comprising a first and a second pair of spaced parallel legs, each pair comprising a downwardly and forwardly extending leg and a downwardly and rearwardly extending leg and first pivot means interconnecting the legs of each pair for relative scissor type movement and said first pivot means defining a common axis through the legs of each pair, each forwardly extending leg being of a common length and comprising an upper end and a lower end and said upper ends being coplanar at all times upon scissor movement of the legs, each rearwardly extending leg being of a common length and comprising an upper end and a lower end and said upper ends being coplanar at all times with one another upon scissor type movement of the legs and substantially coplanar with the upper ends of said forwardly extending legs, the lower ends of said forwardly extending legs comprising foot means, an axle of a predetermined length spanning the lower ends of said rearwardly extending legs, means rotatably connecting the lower ends of said rearwardly extending legs to the axle, and a wheel journaled on the axle adjacent each of the lower ends of said rearwardly extending legs, a generally planar support tray for a disposable plastic bag, said tray having a rear portion and a forward portion, said rear portion being mounted to said axle for swinging movement toward and away from said first pivot means, first mutually intercooperating hook means on the forward portion of said tray and adjacent the lower ends of said forwardly extending legs for hooked-up engagement of said tray at the forward portion to the lower ends of the forwardly extending legs, a ring structure with a rear portion and a forward portion, second pivot means connecting the upper ends of the forwardly extending legs to the rear portion of the ring structure for swinging movement of the forward portion of the ring structure toward and away from said first pivot means, second mutually intercooperating hook means on the upper end of the forward portion of the ring structure for hooking engaging with the upper ends of the rearwardly extending legs, said ring structure defining a closed loop of predetermined size and shape, said ring structure having an upper surface, downwardly extending side surfaces, and a bottom surface and said side surfaces each having a portion converging toward said bottom surface, and bag keeper means comprising a keeper ring of yieldable plastic material of a size substantially equal to said predetermined size and shape of said ring structure and said keeper means having an annular axially facing recess defining side surfaces and a top surface and said recess being companionately sized to receive said ring structure, said side surfaces defining a recess mouth between said side surfaces of

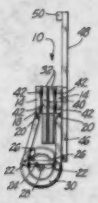
said recess, said ring structure being adapted to be nested snugly in said recess with said recess mouth yieldably engaging said converging surface portions of said ring structure to releasably hold the bag mouth zone between the ring structure and keeper means in a bag open position while the bottom is supported on said tray.

4,138,140

FOLDING STRUCTURES USEFUL AS TWO-WHEELED CARTS

Edward D. O'Brian, 910 Iroquois, Anaheim, Calif. 92801, and William M. Plachy, 3353 San Marcos Bl., San Marcos, Calif. 92069

Filed Apr. 12, 1977, Ser. No. 786,832
Int. Cl.² B62B *3/02*
U.S. Cl. 280—652 **22 Claims**



1. A folding structure which in an unfolded configuration has side walls spaced from one another, end walls connecting spaced extremities of said side walls and connecting means connecting adjacent edges of said side walls in which the improvement comprises:

said connecting means pivotally connecting said adjacent edges of said side walls so that said side walls may be moved generally toward one another in manipulating said folding structure from said unfolded configuration into said folded configuration,

at least one of said side walls including two panels and side hinge means, said side hinge means pivotally joining said panels in edge-to-edge relationship so that said panels have adjacent edges extending parallel to said connecting means,

each of said end walls consisting of two wall sections and a center hinge means, said wall sections in each of said end walls having adjacent center edges and side edges, said center edge hinge means pivotally connecting said center edges of said wall sections in each of said end walls, and

a side edge hinge means securing each of said side edges of said wall sections to said side walls, said side edge hinge means being connected to the side panel of each side wall consisting of two panels which is farthest remote from said connecting means,

said panels of each of said side walls being pivotally connected so as to be capable of pivoting relative to one another so as to be beside one another and between said side walls when said structure is in said unfolded configuration,

said panels of each of said end walls being aligned with one another when said structure is in said unfolded configuration.

4,138,141

FORCE ABSORBING DEVICE AND FORCE TRANSMISSION DEVICE

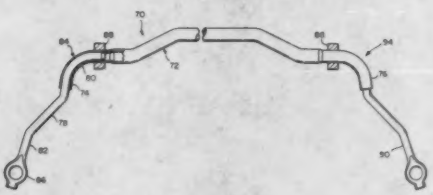
George L. Andersen, Columbus, Ohio, assignor to General Signal Corporation, Rochester, N.Y.

Filed Feb. 23, 1977, Ser. No. 771,139
Int. Cl.² B60G *19/00, 21/00*
U.S. Cl. 280—689 **3 Claims**

1. A force absorbing device comprising:

a first member having a tubular configuration and having first and second ends, said first end of said first member including an attachment means;

a second member having first and second ends, said first end of said second member extending into said second end of said first member, and said first end of said second member engaging said second end of said first member in an interference fit to form a permanent joint therebetween;



said first member and said second member having complementary bends at said permanent joint;

said force absorbing device being a torsion bar adapted to be utilized in an automobile suspension system; and

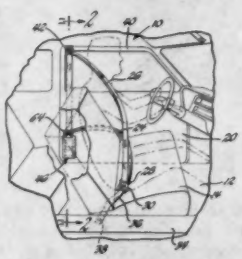
said attachment means on said first end of said first member being a hexagonal fitting formed on the outside of said first member.

4,138,142

PASSIVE LAP AND SHOULDER BELT SYSTEM

Gary A. Wize, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1977, Ser. No. 864,551
Int. Cl.² B60R *21/10*
U.S. Cl. 280—745 **4 Claims**



1. In combination with a vehicle body having an occupant compartment in which an occupant seat is accessible through a door opening selectively opened and closed by a movable door, a passive occupant restraining belt arrangement comprising:

a lap belt and a shoulder belt having inboard ends and outboard ends;

means mounting the inboard ends of the lap belt and shoulder belt on the vehicle body generally adjacent the hip of the occupant;

retractor means mounted on the door adjacent the hip of the occupant and mounting the outboard ends of the lap belt and the shoulder belt for winding the belts thereon upon closing movement of the door and unwinding the belts therefrom upon opening movement of the door;

an anchor loop mounted on the door generally adjacent the shoulder of the occupant and slidably receiving the shoulder belt to dispose the shoulder belt diagonally across the chest of the occupant when the door is closed and dispose the shoulder belt in an occupant access position forwardly of the seat when the door is open;

and connecting means acting between the lap belt and the shoulder belt to move the lap belt along the door toward

the anchor loop during opening movement of the door whereby the lap belt assumes an occupant access position generally parallel with the access position of the shoulder belt to facilitate occupant ingress and egress.

4,138,143
LOOSE LEAF BINDERS

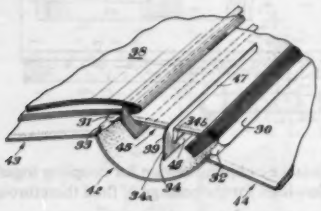
Michael J. A. Lawes, 11 Jew St., Brighton, Sussex, BN1 1UT, England

Continuation of Ser. No. 100,310, Dec. 21, 1970, abandoned, Continuation-in-part of Ser. No. 21,652, Mar. 23, 1970, abandoned. This application May 31, 1974, Ser. No. 475,126

Claims priority, application United Kingdom, Jan. 5, 1970, 400/70; Jul. 22, 1970, 35453/70; Canada, Mar. 19, 1970, 077831; France, Mar. 18, 1970, 70.09745; Fed. Rep. of Germany, Mar. 10, 1970, 2011111; Mar. 10, 1970, 7008623[U]; Netherlands, Jun. 9, 1970, 7008341

Int. Cl.[2] B42D *13/00, 3/02*

U.S. Cl. 281—47 **15 Claims**



1. A loose leaf binder comprising two substantially rigid covers hingeable with respect to a substantially semi-rigid outer curved spine along each of its two longitudinal edges, said outer curved spine being integrally formed with said covers, an inner rigid flat spine hingedly connected along each of its two longitudinal edges to said covers by means of welds extending substantially along hinge lines between said covers and said outer spine, and paper-retaining means for releasably retaining paper, said paper retaining means being provided on said inner spine, each of said covers comprising a board covered on the outside and enclosed in flexible weldable material, said outer spine including an intermediate strip of semi-rigid weldable material enclosed in said flexible weldable material, the two board and the intermediate strip being enclosed between two continuous sheets of said flexible material, said binder including a plurality of welds between said flexible and semi-rigid materials, each weld extending substantially across the width of the outer spine and the welds being spaced along the length of the spine.

4,138,144
WELLHEAD SEALING ASSEMBLY

Elwood K. Pierce, Jr., Coldspring, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Apr. 26, 1977, Ser. No. 791,114

Int. Cl.[2] F16L *35/00*

U.S. Cl. 285—18 **9 Claims**

1. A sealing assembly for sealing the annulus betwen a wellhead and a casing hanger comprising,

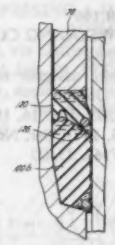
locking means connected to the assembly for locking the assembly in said annulus,

said assembly including a recess for receiving a sealing element, said recess including an upwardly directed shoulder against which a sealing element is set, said shoulder being tapered downwardly and outwardly, said recess including a portion adjacent said shoulder tapering outwardly and downwardly for providing a restricted area for receiving a sealing element,

a tubular resilient sealing element having a cylindrical inside and outside surface positioned in said recess whereby the tubular portion positioned in the restricted area is compressed to provide a seal, said element at its lower end tapering outwardly and downwardly, said element including a metal ring adjacent the lower outside corner of said seal for restricting the extrusion of the resilient sealing element between the wellhead and a casing hanger,

seal actuating means connected to the assembly for moving the sealing element into a sealing position,

said resilient sealing element including a wedge on the top between the inside and the outside of the element, said wedge being directed upwardly,



a second resilient sealing element positioned on top of the first sealing element, said second element including a recess on the bottom between the inside and the outside of the second element for coacting with the wedge for compressing the second element outwardly and inwardly when the second element is moved against the first element and said second resilient sealing element includes a metal ring adjacent the lower outside corner for holding the lower outside corner inwardly as the sealing assembly is moved downwardly in a well.

4,138,145
PIPE COUPLINGS

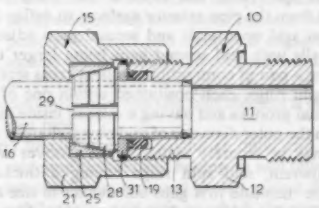
Anthony J. Lawrence, Tewkesbury, England, assignor to The Tungum Company Limited, Cheltenham, United Kingdom

Filed Sep. 28, 1976, Ser. No. 727,606

Claims priority, application United Kingdom, Oct. 2, 1975, 40255/75

Int. Cl.[2] F16L *55/00*

U.S. Cl. 285—23 **1 Claim**



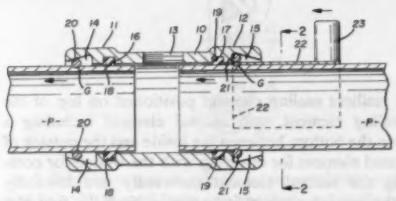
1. A pipe coupling comprising a body having a threaded portion, a bore to receive a pipe and an enlargement of said bore, a sealing element disposed within said enlargement to provide a seal between the body and a pipe, a threaded member which is threaded for engagement with the threaded portion of the body, a pipe-gripping collar within a bore of said threaded member and arranged so that, upon rotation of said threaded member relative to the body, the collar is contracted radially to grip the pipe, said collar having an external wedge surface which coacts with an internal wedge surface of a slip ring located within the bore of the threaded member against an internal shoulder of said threaded member, and a washer having circumferentially continuous means bonded thereto resiliently engageable with the thread of the threaded member so as to retain the slip ring and the pipe-gripping collar within the

bore of the threaded member, said washer having a rigid portion arranged so that, upon rotation of the threaded member relative to the body, the rigid portion engages the body for the transmission of thrust, axially of the pipe, between the body and the pipe-gripping collar and wherein said rigid portion of the washer carries a resilient backing ring bonded thereto which is arranged, in use, to enter said enlargement of the bore of the body to prevent extrusion of the material of the sealing element under pressure.

4,138,146
PIPE COUPLING WITH A WEDGING CONTRACTIBLE RING

Edgar B. Rumble, Girard, Ohio, assignor to Michigan Pipe Fittings Company, Hubbard, Ohio

Continuation of Ser. No. 696,508, Jun. 16, 1976, abandoned. This application Sep. 13, 1977, Ser. No. 832,949
Int. Cl.² F16L *35/00*
U.S. Cl. 285—39 **6 Claims**



1. A readily separable coupling for joining together a pair of pipes, each having a cross sectionally arcuate circumferential groove defined in the exterior surface thereof adjacent one end, comprising:

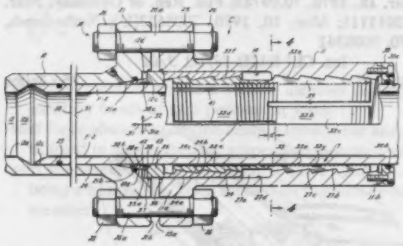
a cylindrical body having a pair of open ends, each receiving one of said pair of pipes,

a pair of circumferentially tapered channels, each located on the inner surface of one of said open ends and having a tapered side wall and a perpendicular back wall, said tapered side wall arranged so that the smallest diameter of each of said tapered channels is located at said open end of the cylindrical body, said back walls being integral with said cylindrical body and located at the other ends of said tapered channels, said side walls tapering from said back walls to said open ends, said tapered side walls being spaced apart from the pipe exterior surfaces to define first gaps adjacent said open ends and second gaps adjacent said back walls with said second gaps being larger than said first gaps; a pair of contractible resilient cross sectionally round split rings, each positioned within one of the circumferential grooves and having a relaxed inside diameter less than the outer diameter of said pipes whereby said split rings may be securely seated in the grooves when positioned therein, said split rings having a thickness greater in size than said first gaps but smaller in size than said second gaps, said second gaps having a diameter which is greater than the diameter of the pipe and the split ring thereon, said split rings each being unconstrained within said tapered channels to be free to move inwardly thereof toward said back walls when the pipes are moved in that direction whereby said rings are freed from contact with said tapered walls; split ring unlocking means arranged for operation when said pipes are moved inwardly of said coupling acting to move said cross sectionally round split rings substantially out of the circumferential grooves, said means comprising a partial sleeve member for partially surrounding one of the pipes, a handle on said sleeve member for moving said sleeve member longitudinally of said pipes, said sleeve member sized to fit through said first gaps to move inwardly of said coupling for insertion between one of said split rings and the pipe exterior surface so as to disengage said one split ring from the pipe to free the pipe from the coupling; and sealing means in said coupling comprising annular grooves in the inner surface of the coupling located inwardly thereof with respect to the circumferentially tapred channels and resilient gaskets retained in said annular grooves for sealing engagement with said pipes.

4,138,147
COUPLING DEVICE

Luther L. Manchester, 810 Woodstock, Bellaire, Tex. 77401, and Bobby J. Reneau, 15527 Morales, Houston, Tex. 77039

Filed Dec. 27, 1976, Ser. No. 754,839
Int. Cl.² F16L *27/00*
U.S. Cl. 285—165 **7 Claims**



1. A variable distance coupling device for coupling together first and second flowlines for the passage of fluid therethrough, comprising:

a first housing section for connection with a first flowline and a second housing section for connection to a second flowline;

each of said first and second housing sections having a bore formed by interior wall portions thereof to receive said second flowline and to provide for relative longitudinal movement between said housing sections and said second flowline;

housing interconnection means for connecting said first and second housing sections together, said first and second housing sections being moved closer together by said housing interconnection means;

grip-seal means mounted in said first and second housing sections for gripping and sealing said second flowline in said bores of said housing sections after said second flowline is longitudinally adjustably positioned in said first and second housing sections;

said grip-seal means including a seal ring assembly positioned partly in both said first and second housing bores for movement into a sealing position with such second flowline and said interior wall portions in response to said first and second housing sections being moved closer together by said housing interconnection means;

said grip-seal means including an actuator gripping sleeve mounted in said second housing bore about said second flowline, said actuator sleeve having an outside surface configuration cooperating with a second housing section interior wall configuration which has means therewith to cooperate with said actuator sleeve outside surface for causing said actuator sleeve to grip said second flowline in response to relative movement between said first and second housing sections;

a force transfer sleeve mounted in said second housing bore about said actuator sleeve, said force transfer sleeve having an inside wall which cooperates with said outside surface of said actuator sleeve to move said actuator sleeve into gripping engagement with said second flowline in response to relative movement between said first and second housing sections which causes longitudinal movement of said force transfer sleeve thereby causing said actuator sleeve to move into gripping engagement with said second flowline;

said seal ring assembly including a first, wedging seal ring positioned in said first housing section bore for movement to a sealed position between said first housing section bore and said second flowline in response to relative longitudinal movement of said force transfer sleeve; and

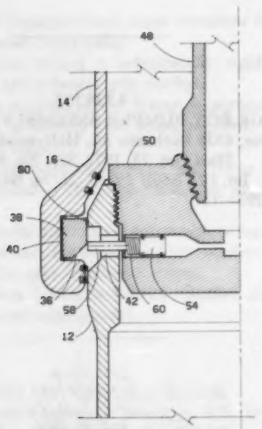
said seal ring assembly including a second seal ring mounted in both said first and second housing bores about said second flowline between said force transfer sleeve and said first-mentioned seal ring for sealingly engaging said first and second housing sections.

4,138,148

SPLIT-RING RISER LATCH

Hubart B. Zaremba, London, England, assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 25, 1977, Ser. No. 790,728
Int. Cl.[2] E21B *17/08, 19/16;* F16B *21/07;* F16L *37/08*
U.S. Cl. 285—317 **9 Claims**



1. A releasable connector for connecting a lower end of a marine riser pipe and the upper end of a casing string set in a subsea well which comprises:

(a) a latch box (16) on the lower end of said riser pipe and having

(i) a downwardly facing shoulder (26);

(ii) an internal vertical cylindrical surface (32);

(iii) a lock ring (38) carried in a latching groove in said latch box above said vertical surface;

(iv) biasing means (40) urging said lock ring inwardly;

(b) a latch pin on said casing string and having

(i) an outwardly facing vertical cylindrical surface (30) mating with said vertical cylindrical surface of said latch box;

(ii) a latching groove (18) for receiving said lock ring when said inwardly facing vertical cylindrical surface of said latch box mates with said outwardly facing vertical cylindrical surface of said latch pin; and

(iii) port means in and extending radially through the wall of said latch pin above said vertical cylindrical surface and extending to said latching groove of said latch pin.

9. A releasing tool for connecting to the lower end of a string of drill pipe which comprises:

a cylindrical body member;

a central chamber in said body connectable to said drill pipe to be in fluid communication with the interior of said drill pipe;

a plurality of cylinders in said body which are radially aligned, each opening to the external circumference of said body member;

a piston in each said cylinder, each said piston having an outwardly extending releasing rod;

mechanical means supported by said body biasing said piston inwardly;

a passage for each said cylinder connecting the inner end of said cylinder with said chamber; and

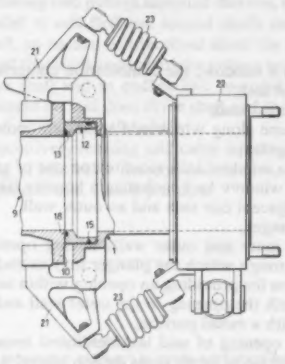
stop means on said body member at a fixed circumferential position with respect to each said cylinder.

4,138,149

PIPE ELEMENT WITH A TERMINAL HYDRAULIC SEAL COMPRISING A DIFFERENTIAL MOBILE MEMBER

Giorgio Bormioli, via Galileo Galilei, 21, Padova, Italy

Filed Jun. 29, 1977, Ser. No. 811,087
Claims priority, application Italy, Jul. 6, 1976, 25059 A/76
Int. Cl.[2] F16L *23/00*
U.S. Cl. 285—320 **1 Claim**



1. In a pipe element designed for rapid connection to a pipe provided with a terminal, external flange, said pipe element being provided with a rapid connecting device including a plurality of rotatable gripping members and corresponding plurality of rods of elastically variable length adapted to cause the closure of said gripping members, the improvement comprising

a tubular hydraulic seal member disposed coaxially inside a counterbore in one end of said pipe element for unencumbered axial sliding movement into and out of an innermost position in which said member is engaged at its inner end against the bottom of said counterbore, and for unencumbered axial sliding movement out of the open end of said counterbore, when said pipe element is disconnected from said pipe,

said tubular member having an outer end extending out of said pipe element and having on said outer end a terminal, internal flange arranged to abut against the terminal external flange on said pipe to which the pipe element is to be connected,

a first annular gasket surrounding said tubular member and disposed to have fluid-tight engagement with the surrounding inner wall of said pipe element in which said tubular member is axially slidable, and

a second annular gasket, having a diameter smaller than the diameter of said first gasket, and mounted in an annular recess in the end face of said internal flange on said outer end of said tubular member for fluid-tight engagement with the confronting surface on the external flange of said pipe,

said gripping means being arranged to thrust said external flange of said pipe into abutting engagement with said internal flange on said tubular member thereby to effect said fluid-tight engagement of said second gasket with the confronting face of said external flange on said pipe.

4,138,150

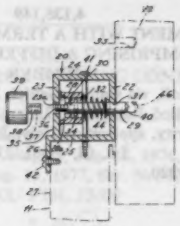
WINDOW LOCK

Marius W. Bills, 16220 Schoolcraft, Detroit, Mich. 48227

Continuation of Ser. No. 618,622, Oct. 1, 1975, abandoned. This application Mar. 4, 1977, Ser. No. 774,459

Int. Cl.[2] E05B *69/00*

U.S. Cl. 292—60 **11 Claims**



1. In a window, the combination comprising
a first sash,
a second sash,
a frame along which said sashes are moved relative to one another,
and a window lock mounted on one of said sashes,
said window lock including a housing having an inner wall adjacent one sash and an outer wall,
a plunger,
said inner and outer walls having openings therethrough through which the plunger may extend,
means for providing an opening within said housing aligned with the opening in the outer wall and having a portion with a radial portion,
said opening of said last-mentioned means having another portion of larger cross section whereby said radial portion of said plunger is rotatably unrestrained when said radial projection is positioned at said portion,
said plunger having a radial projection conforming generally to the radial portion of said opening defined by said last-mentioned means when said radial projection is positioned therein,
said other sash having an opening adapted to be engaged by said plunger such that when the plunger is in engagement with said opening in said other sash the other end of said plunger extends into the opening in the outer wall and is spaced inwardly relative to the outer surface of the outer wall,
a spring yieldingly urging said plunger in a direction toward said other sash,
and means releasably engageable with the outer end of the plunger for engaging the plunger and moving it axially to unlock the sashes.

4,138,151

DETENT DEVICE FOR LOCKING THE LID OF A CASSETTE RECEIVING COMPARTMENT OF A TAPE RECORDER

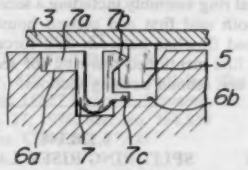
Toshihiro Nakao, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jul. 27, 1977, Ser. No. 819,573

Int. Cl.[2] E05C *19/06, 19/02*

U.S. Cl. 292—76 **3 Claims**

1. A resilient detent device for the lid of a casing including means defining an opening with said lid being mounted on said casing to open and close said opening, said detent device comprising a generally U-shaped lock spring having a pair of resilient legs and provided near the end of one of said legs with a first projection, compartment means formed in said casing for operatively housing therein said lock spring in operative position, a lock member formed to project from a part of said lid and arranged to engage said first projection of said lock spring thereby to cause to be applied to said lid during opening and closing thereof a spring force developed by said U-shaped lock spring, a second projection formed on said one leg, and means defining a ledge in said compartment means, said second projection being engaged on said ledge against the spring force of



said lock spring, with the engagement between said second projection and said ledge operating to modify the spring force applied to said lid by the engagement between said lock member and said first projection.

4,138,152

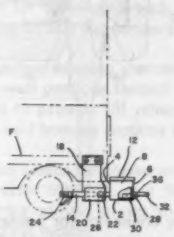
STORAGE BOX BUMPER ASSEMBLY FOR VEHICLES

Oscar Prue, 6330 Buchanan St., Hollywood, Fla. 33024

Filed Oct. 25, 1977, Ser. No. 844,798

Int. Cl.[2] B60R *19/00, 21/14;* B61F *19/04*

U.S. Cl. 293—117 **2 Claims**



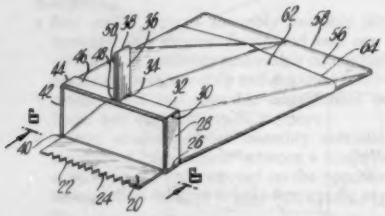
1. A storage box bumper assembly for vehicles comprising an elongated floor portion, a rear wall portion upstanding from said floor portion, a front wall portion upstanding from said floor portion, said front wall portion extending rearwardly at either end thereof to join said rear wall portion forming a chamber on said floor portion between said front and rear wall portions, a top portion hingedly mounted on one of said wall portions and adapted to overlie said chamber and enclose said chamber, and first and second frame members, each of said frame members comprising a rigid elongated rod, a bottom portion of said rod proximate a first end thereof being connected to an upper surface of said floor portion, said rod extending through and outwardly from said rear wall portion substantially normal thereto, said frame members extending substantially parallel to each other and being of substantially equal length, a pair of distinct and separate bolt plates for attachment to frame portions of said vehicle on either side of said vehicle, each bolt plate having a box thereon, each of said boxes being adapted to receive one of said frame members, and lock means for fixing said frame member in said box, said lock means comprising holes in said box and a lock pin adapted to enter and be retained in said box holes, a plurality of holes in said frame member proximate a free end of said frame member and at least one hole in said frame member proximate said rear wall, said frame holes being selectively alignable with said box holes and said lock pin being operative to engage a selected one of said frame holes and said box holes to lock said frame member to said box.

4,138,153

SANITARY SELF-CONTAINED FECAL WASTE CONTAINER

Jeffrey L. Brown, 60 Bates Rd., Harrison, N.Y. 10528

Filed Sep. 12, 1977, Ser. No. 832,496
Int. Cl.[2] A01K *29/00*; A47L *13/52*
U.S. Cl. 294—1 R **2 Claims**



1. A sanitary self-contained fecal waste container for cleaning up after pet animals comprising:

a collapsible frame having a substantially rigid bottom shovel portion and a handle grip portion

receptacle means secured to the frame, a portion of said means adapted to enclose said frame together with the contents of said means

whereby all contaminated portions of said frame and said means are enclosed within said means for sanitary disposal.

said receptacle means including a pouch consisting of a bag having a closed end and a double-over portion to completely internalize said collapsible frame,

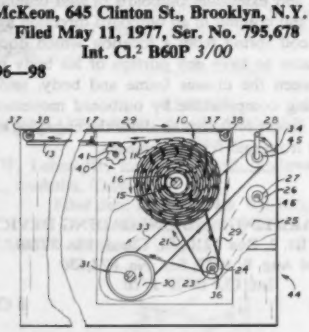
said shovel portion having a barrier member releasably secured to the rear edge thereof.

4,138,154

SLIDING COVER FOR A TRUCK

James J. McKeon, 645 Clinton St., Brooklyn, N.Y. 11232

Filed May 11, 1977, Ser. No. 795,678
Int. Cl.[2] B60P *3/00*
U.S. Cl. 296—98 **7 Claims**



1. An overhead door assembly for a truck, including a pair of spaced-apart, upstanding sidewalls having means adjacent to the top edges thereof for slidably supporting therebetween a generally horizontally-disposed door, comprising:

an overhead door, including a multiplicity of elongated, flat, generally rectangular, relatively rigid panels, successively disposed adjacent to one another, with each of said panels being pivotably secured along their longitudinal edges to the panels adjacent thereto, to permit coiling and uncoiling of said door, said door being slidably movable on the walls of the truck to permit movement thereof between an open and closed position;

a rotatable door winding drum, to which one end of said door is coupled to permit coiling and uncoiling of said door thereon;

at least one cable, one end of which is coupled to the other end of said door;

a rotatable cable winding drum to which the other end of the cable is coupled, to permit coiling and uncoiling of said cable thereon;

a freely-rotatable first shaft on which said door winding drum is coaxially mounted, and a freely-rotatable second shaft on which said cable winding drum is coaxially mounted, disposed generally beneath and parallel to said first shaft, each of said shafts having a pulley mounted thereon;

drive means for positively rotating said door winding drum, to effect coiling of said door thereon and, in turn, movement of said door to said open position, said drive means for said door winding drum including a freely-rotatable door drive shaft having a pulley mounted thereon, spaced from and parallel to said first shaft, a freely-rotatable transfer shaft having two pulleys mounted thereon, spaced from and parallel to said first and second shafts and said door drive shaft, an endless belt received about the pulley mounted on said first shaft and one of the pulleys mounted on said transfer shaft and an endless belt received about the pulley mounted on said door drive shaft and the other pulley mounted on said transfer shaft;

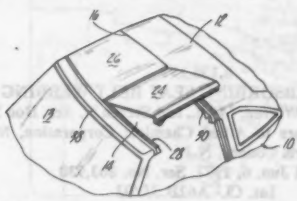
drive means for positively rotating said cable winding drum to effect coiling of said cable thereon and, in turn, movement of said door to said closed position.

4,138,155

REMOVABLE ROOF PANELS FOR VEHICLES

Richard R. Chrysler, 8940 Rickett Rd., Brighton, Mich. 48116

Continuation-in-part of Ser. No. 755,665, Dec. 30, 1976. This application Nov. 4, 1977, Ser. No. 848,483
Int. Cl.[2] B60J *7/08*
U.S. Cl. 296—137 B **10 Claims**

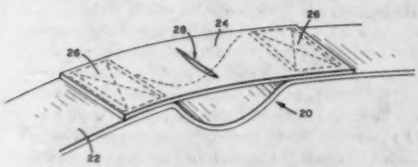


1. A roof assembly for a vehicle having a windshield header and window openings at opposite sides of the vehicle, said vehicle forming a transverse opening in the vehicle roof defined by a forward edge portion and rearward edge portion in said roof, said edge portions extending from a window opening at one side of said vehicle to the window opening at the other side of said vehicle, an H-shaped frame having a forward frame portion and a rearward frame portion joined integrally with a center frame portion, said H-shaped frame having said forward frame portion connected to said forward edge and said rearward frame portion connected to said rearward edge with said center frame portion disposed on the center line of said vehicle, said H-shaped frame forming a pair of oppositely extending spaces at the opposite sides of said central frame portion, and a pair of panels removably covering said openings, said H-shaped frame forming transverse extending drainage channels communicating with each other by a central drainage channel, said channels being adjacent edge portions of said panels when the latter are in a closed position relative to said openings.

4,138,156
WEARABLE CHAIR
Darcy R. Bonner, 4700 Royal La., Dallas, Tex. 75229
Filed Sep. 6, 1977, Ser. No. 830,469
Int. Cl.[2] A47C *1/00*
U.S. Cl. 297—4 22 Claims

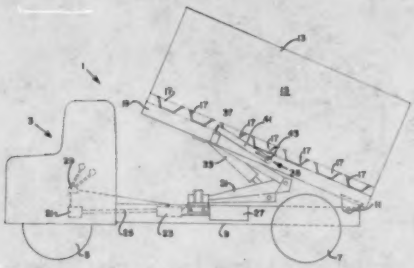
1. An apparatus for supporting the weight of an individual's body from a ground surface including a unit for attachment to each leg of the individual, each unit comprising:
- a lower bar having a top section and a bottom section slidable relative to the top section;
- means for attaching the top section of said lower bar to the leg of the individual;
- an upper bar;
- means for hingeably connecting said upper bar from the top section of said lower bar; and
- a brace member selectively positionable between said upper bar and the bottom section of said lower bar to telescope the bottom section from the top section of said lower bar as said upper bar is rotated toward said lower bar for engagement of the lower section of said lower bar with the ground surface from which the weight of the individual's body may be supported.

4,138,157
ENERGY ABSORBING SEAT BELT WEBBING
David A. Pickett, Warren, Mich., and Steven N. Acs, Don Mills, Canada, assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.
Filed Jun. 6, 1977, Ser. No. 803,930
Int. Cl.[2] A62B *35/02*
U.S. Cl. 297—386 13 Claims



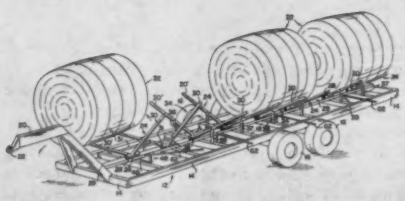
1. An energy absorbing seat belt restraint comprising seat belt webbing adapted for securing a wearer in a vehicle, said webbing being formed from warp and weft yarns, and at least one integral discontinuity in said warp yarns along the length of said webbing, whereby said webbing is capable of absorbing kinetic energy imparted thereto by movement of said wearer thereagainst, said restraint being in a form adapted for storage on a seat belt retractor.

4,138,158
DUMP BODY BRACE
Eldon D. Jones, R.R. 2, Lake Crystal, Minn. 56055
Filed Oct. 17, 1977, Ser. No. 842,715
Int. Cl.[2] B60P *1/04*
U.S. Cl. 298—17 B 24 Claims



1. A safety brace mechanism for holding a dump body pivotally mounted on a truck chassis frame in an elevated position above said chassis frame, the safety brace mechanism including a hollow open ended cavity extending laterally in said body, a shaft extending through said cavity and being rotatable therewithin, an outboard end of said shaft extending beyond the open end of said cavity, said outboard end of said shaft being secured to an elongated support column radially extending therefrom and located outboard of said body, coil spring means located in connection with said shaft to normally bias the support column toward said body, retaining means extending laterally from the support column toward the body, means provided in the body for engaging the retaining means, said coil spring means normally biasing the retaining means into engagement with said engaging means, and manually operable handle means connected to the support column porximal its shaft connection and extending outboard of said column for pulling the shaft and column in an outboard direction against the bias of said coil spring from a location which does not require the operator to have any portion of his body in the pinch point between the chassis frame and body, said coil spring means being compressible by outboard movement of said handle to an extent sufficient to allow the engaging means to be disengaged from said retaining means.

4,138,159
ARTICLE CARRYING AND UNLOADING DEVICE
Thomas E. Hall, Rt. 2, Box 1210, St. Cloud, Fla. 32769
Filed Aug. 8, 1977, Ser. No. 822,630
Int. Cl.[2] B60P *1/16*
U.S. Cl. 298—18 6 Claims



1. An article carrying and unloading device comprising in combination:
- a support frame;
- at least one carrier assembly movably connected to said support frame and including cradle means, said cradle means including a base portion pivotally connected to said

support frame so as to permit movement of said cradle means between a carrying and an unloading position;

said cradle means further including cradle sides connected to said base portion and extending substantially outwardly therefrom on opposite sides of said base portion;

cradle support means interconnected between said support frame and at least one cradle side and in supporting relation to said one cradle side and, said cradle support means comprising

a first cradle support assembly movably interconnected between said support frame and said one cradle side, said locking assembly removably connected to said first cradle support assembly and disposed relative thereto to define fixed and movable engagement between said frame and said first cradle support;

a second cradle support assembly extending in cradle supporting engagement between a cradle side and said support frame and disposed on the opposite side of said base portion relative to said first cradle support assembly;

said first and second cradle support assemblies extending outwardly from said support frame into supporting engagement with said cradle sides, said cradle sides thereby disposed in spaced relation to said support frame, said latter disposition defining the article carrying position; and wherein

said first cradle support assembly includes an effective longitudinal dimension lesser than said second cradle support assembly, said cradle side associated with said second cradle support assembly being closer spaced to said support frame than the opposite cradle side, whereby the weight of an article on said cradle means is biased toward said first cradle support assembly; and

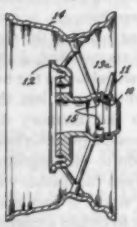
unloading means interconnected between said frame and said cradle support means, said unloading means including a locking assembly movably interconnected between said cradle support means and said support frame and movably disposed relative to said cradle support means so as to allow the fixed and movable engagement between said cradle support means and said support frame, whereby said cradle means is transferrable between said carrying and said unloading position upon movable engagement between said cradle support means and said support frame.

4,138,160

SIMULATED KNOCK OFF SPINNER NUT AND ADAPTER

Kurt W. Lohmeyer, Fullerton, Calif., assignor to Tru-Spoke, Inc., Anaheim, Calif.

Filed Jun. 29, 1977, Ser. No. 811,044
Int. Cl.[2] B60B 7/06
U.S. Cl. 301—108 S **6 Claims**



1. For use with a vehicle wheel of the type having a hub provided with a portion defining a circular hub opening including a generally smooth interior sidewall surface portion, a simulated knock off wheel spinner nut and adapter comprising:

a. an adapter having a generally cylindrical cross section with a first generally smooth surface portion sized to be slidably inserted into the circular hub opening of a vehicle wheel and provided with means for securement therein, said adapter including an outer portion distal to said first portion and provided with means for attachment of a simulated spinner nut;

b. a simulated spinner nut with a centrally disposed opening in the rear thereof for reception about said outer distal portion;

c. attachment means for securing said spinner nut to said outer distal portion of said adapter; and

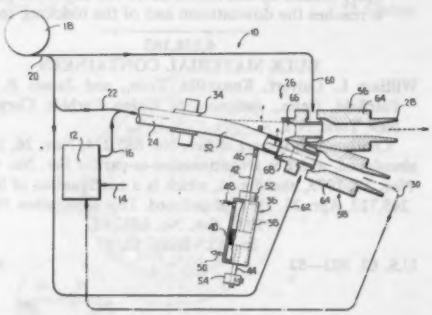
d. said adapter further including a shoulder portion between said first portion and said outer distal portion which shoulder portion is of a larger diameter than said first portion and of a diameter larger than said portion defining the circular hub opening and having a generally vertical sidewall adjacent to said first portion adapted to abut the circular hub opening whereby there is provided a flush appearance between the adapter and the hub of the wheel.

4,138,161

MECHANICAL POWDER FLOW DIVERTING DEVICE

Robert D. Payne, Countryside, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 9, 1977, Ser. No. 823,028
Int. Cl.[2] B65G 53/56
U.S. Cl. 302—28 **10 Claims**



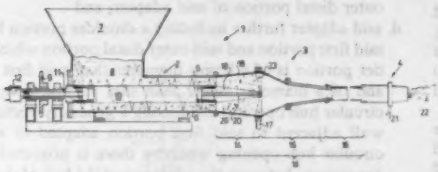
1. For use in an apparatus for the sequential electrostatic coating of individual members, a flow switching device, said flow switching device comprising a supply line having a continuous powder-gas admixture supply, a delivery line for receiving the powder-gas admixture for directing the same against a member to coat the member with powder, a return line for receiving the powder-gas admixture when a member is not in position to be coated, a diverter line having one end continuously connected to said supply, switch means for selectively positioning the other end of said diverter line into alignment with said delivery line and said return line, said flow switching device being improved by said delivery line and said return line each having incorporated therein adjacent said diverter line means for providing continuous gaseous flow therethrough even when said diverter line is not associated therewith for eliminating the customary dead air resistance to flow of the powder-gas admixture when said diverter line is initially shifted into communication therewith.

4,138,162

APPARATUS FOR PIPED CONVEYANCE OF MATERIAL

John P. Norén, Kedjevägen 30, S-194 00 Upplands Väsby, Sweden

Filed Jul. 5, 1977, Ser. No. 812,689
Claims priority, application Sweden, Jul. 6, 1976, 7607669
Int. Cl.[2] B65G 53/48
U.S. Cl. 302—50 6 Claims



1. An apparatus for the piped conveyance of material, such as concrete mixtures, comprising

feed means for supplying the material,

a conveyor pipe connected to the feed means to transport the material;

a blocking section located at the upstream end of the conveyor pipe so as to receive material from the feed means; and

at least one compressed air supply means for introducing compressed air into the conveyor pipe, the compressed air supply means being located at the downstream end of the blocking section;

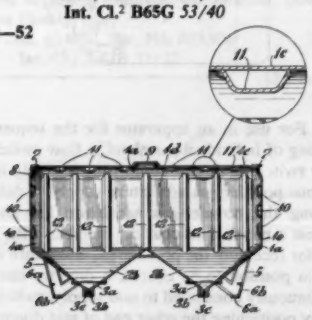
the blocking section being formed in the shape of a truncated cone with its smaller end connected to the feed means and its larger end oriented downstream to thus form an increasing cross-sectional area for flow of the material so that the compressed air will cause the material both to form a plug in the blocking section to prevent passage of the compressed air to the feed means and to be continuously broken up and blown down the conveyor pipe once it reaches the downstream end of the blocking section.

4,138,163

BULK MATERIAL CONTAINERS

William L. Calvert, Knoxville, Tenn., and James R. Fisher, Fairfield, Conn., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 635,274, Nov. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 415,190, Nov. 12, 1973, abandoned, which is a continuation of Ser. No. 245,712, Apr. 20, 1972, abandoned. This application Nov. 21, 1977, Ser. No. 853,761
Int. Cl.[2] B65G 53/40
U.S. Cl. 302—52 9 Claims



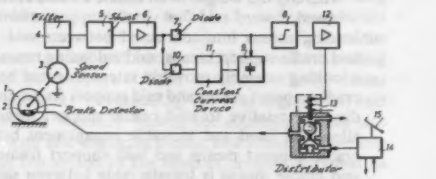
1. A container for use in the bulk handling of flowable particulate materials comprising a closed, generally rectangular parallelepipedon upper container body portion, having side walls, end walls and a roof, and a lower base portion; means permitting the introduction and withdrawal of said particulate materials to and from said container body; said lower base portion supporting a vertical flexure panel at each corner thereof, said vertical flexure panels supporting opposed pairs of longitudinal and transverse flexure panels between the tops thereof; exterior outer skin members bonded as the side and end walls and roof of said container body portion to said flexure panels; a plurality of horizontal non-intersecting internal end wall stiffener means bonded to each of said end walls, each terminating at opposite ends in a junction with one of said pair of vertical flexure panels; a plurality of vertical, non-intersecting internal side wall stiffener means bonded to each of said side walls, each terminated at opposite ends in a junction with one of said longitudinal flexure panels and said lower base portion; and a plurality of transverse, internal, non-intersecting roof stiffener means bonded to said roof, and each terminated at opposite ends in a junction with one of said pair of longitudinal flexure panels; whereby said side walls, end walls and roof may deflect independently of each other to provide overall container flexural capability while avoiding areas of high stress concentration.

4,138,164

APPARATUS FOR ADJUSTING BRAKING FORCES ON VEHICLE WHEELS AS A FUNCTION OF DECELERATION AND ACCELERATION OF THE BRAKED WHEELS

Jean Masclet, Paris, France, assignor to Messer-Hispano, Montrouge, France

Continuation of Ser. No. 565,253, Apr. 4, 1975, abandoned. This application Jan. 10, 1978, Ser. No. 868,462
Claims priority, application France, Apr. 12, 1974, 74 13045
Int. Cl.[2] B60T 8/08
U.S. Cl. 303—105 6 Claims



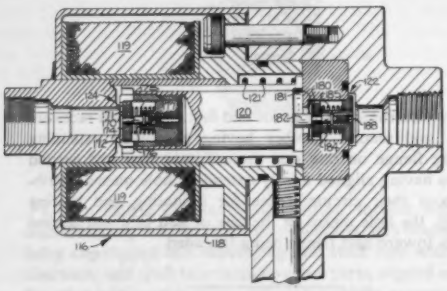
1. A system of adjusting the braking force of brakes applied to a vehicle wheel, based on the deceleration and acceleration of the wheels of the vehicle during braking, comprising an element which provides a signal which is a function of the speed of each of the wheels; a shunt device receiving this signal; a diode which only passes deceleration signals connected to said shunt device; a threshold device connected to said diode for passing a control signal, means connected to said threshold device for receiving said control signal for controlling the disengagement of the brake from the corresponding wheel and operating on an all-or-nothing basis, in the case of exaggerated skidding; means including a second diode connected in parallel with the first diode and only passing acceleration signals therethrough, a memory, and a memory discharger connected in series; the signal derived from said shunting device being transmitted, during the subsequent acceleration stage of the wheel when the brake is released, through said second diode which only lets the acceleration signals pass therethrough, to said memory discharger which discharges said memory beyond a predetermined acceleration threshold in inverse proportion to the magnitude of acceleration; a charging resistor between the memory and said first diode such that the deceleration signal is passed to the memory through said charging resistor to obtain a charge which is proportional both to the value of the signal and its duration, said memory discharger including a transistor which operates on constant current, a resistor connecting the second diode to the emitter of said transistor, a resistance bridge connected to the base of the transistor for polarization thereof, said transistor being controlled by the magnitude of acceleration of the wheel when it is picking up speed, when beyond the threshold defined by the polarization of the base of said transistor, said threshold

device comprising a comparator, one of the two inputs of which is polarized by a reference voltage, from a voltage-dividing bridge connected between ground and a constant voltage source, the other input of the comparator being connected to said first diode and the charging resistor.

4,138,165
BRAKE ANTI-LOCKING MODULATOR WITH REAPPLICATION CONTROL

Folke I. Blomberg, Duvstigen 4, S-181 40 Lidingo; Jan-Olov M. Holst, Skogsduvevagen 14, S-75252 Uppsala, and Torbjorn Nordstrom, Skarpbrunnävag. 35I, 145 64 Norsborg, all of Sweden

Filed May 10, 1977, Ser. No. 795,539
Int. Cl.[2] B60T *13/68*
U.S. Cl. 303—115 **3 Claims**



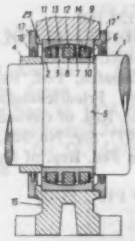
1. Apparatus for braking a vehicle wheel comprising hydraulic fluid responsive braking means for braking a wheel, hydraulic fluid conduit means connected to said braking means, means operatively communicating with said conduit means for applying there through hydraulic fluid pressure for braking the wheel, first and second controllable one-way valve means in series flow relation in said conduit means and defining there between a controlled conduit portion, each of said valve means having a valve member for permitting relatively large volume rates of flow and a seal element cooperating with said valve member for accommodating relatively small volume rates of flow, valve actuator means operatively coupled to said valve means for normally conditioning said valve means for free flow of fluid therethrough and operable for controllably conditioning said valve means to close said valve means against flow of fluid therethrough toward said braking means, said valve means and said valve actuator means cooperating when there are high pressure differentials across said valve means for sequentially opening first said seal elements and then said valve members and thereby facilitating reduction in forces required for valve means actuation, expansible chamber means operatively communicating with said controlled conduit portion for intermittently expanding and contracting the volume thereof, and sensor means responsive to braking of the wheel and operatively connected to said valve actuator means and said expansible chamber means for operating said means to modulate hydraulic fluid pressure.

4,138,166
SLIDE-ARTICULATION BEARING, IN PARTICULAR FOR TILTABLE CONVERTERS

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Dec. 29, 1977, Ser. No. 865,748
Claims priority, application Austria, Jan. 26, 1977, 457/77; Feb. 10, 1977, 882/77
Int. Cl.[2] F16C *23/04*
U.S. Cl. 308—3 R **8 Claims**

1. In a slide-articulation bearing assembly for supporting a shaft having a cylindrical surface, said assembly being of the type including a bearing housing, an inner race fixedly arranged on said shaft to be supported, an outer race inserted in said bearing housing, and sliding elements inserted between said inner race and said outer race so as to permit a relative movement between said inner race and said outer race, said

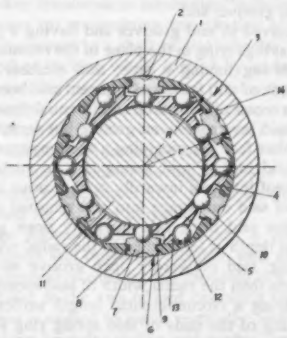


sliding elements being fixed relative to said inner race and said outer race having a spherical sliding face contacting said sliding elements, the improvement comprising recesses in said inner face extending perpendicular to the cylindrical surface of the shaft, said sliding element being embedded in said recesses.

4,138,167
ROLLING BEARING INCLUDING LENGTHWISE CONVEX RACE RAILS

Horst M. Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 3, 1977, Ser. No. 821,472
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1976, 2635053
Int. Cl.[2] F16C *29/06*
U.S. Cl. 308—6 C **13 Claims**



1. In a rolling bearing for lengthwise movement between the rolling bearing and a shaft, wherein the rolling bearing has a housing with a boring, a plurality of endless rows of rolling elements each having a portion with the rolling elements adapted to be radially loaded, a cage in said boring for guiding said rolling elements, and a plurality of race rails supported by said housing and positioned to radially outwardly support said rolling elements in said portion thereof; the improvement wherein said race rails have first sides with convex curvature in the lengthwise direction and defining first races, and second sides opposite said first sides that are straight in the lengthwise direction, said second sides defining second races, the outer portions of each of said first and second sides, in the circumferential direction, each having convex curvature with a radius substantially equal to the radius of said boring of said housing, whereby said race rails may be assembled in said bearing with

either one of said first and second sides facing radially outwardly and engaging said boring of said housing, said race rails each being assembled in said housing with said one side thereof engaging said boring.

4,138,168

AXIAL SECURING ASSEMBLY FOR ROLLER OR BALL BEARINGS

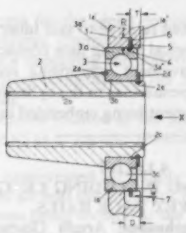
Werner Herlitzek, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,356

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658157

Int. Cl.² F16C *35/06*

U.S. Cl. 308—189 R **3 Claims**



1. A bearing assembly comprising:

an undivided housing member formed with a cylindrical bore and provided between opposite axial faces of said member with an inwardly open circumferential groove;

a rolling bearing received in said bore and comprising a cylindrical outer race close-fitting in said bore, an inner race and a plurality of rolling bodies between said races, said outer race being formed with an outwardly open circumferential groove; and

a spring ring received in said grooves and having a pair of symmetrical flat lugs lying in the plane of the remainder of said ring, each lug having a hole, said member being formed along one of said faces and adjacent said bore with an axially open recess of limited circumferential dimension extending to said inwardly open groove but terminating short of the other face for receiving a tool engageable in the holes of said lugs of said spring ring to enable the spreading thereof into said inwardly open groove to permit insertion of said outer race into and removal of said outer race from said bore, said inwardly open groove having a radial depth at least equal to the radial width of said spring ring, said outwardly open groove having a radial depth less than the radial width of said spring ring, said recess having a circumferential length sufficient to enable spreading of the ends of said spring ring for full recessing of said spring ring by said tool into said inwardly open groove.

4,138,169

TWO ROW ROLLING BEARING ASSEMBLY HAVING SINGLE PIECE INNER RING AND TWO PIECE OUTER RING

Robert Stolz, Schweinfurt, and Walter Hahn, Schonungen, both of Fed. Rep. of Germany, assignors to SKF Industries, Inc., King of Prussia, Pa.

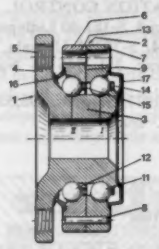
Filed Nov. 11, 1977, Ser. No. 850,794

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1976, 2654607

Int. Cl.² B60B *27/02*; F16C *33/46*

U.S. Cl. 308—189 R **7 Claims**

1. In a rolling bearing assembly having first and second members relatively rotatable with respect to one another and defining first and second races therebetween, rolling elements in said races and defining first and second rows respectively of rolling elements, and means for mounting said first and second members; the improvement wherein said first member comprises first and second elements having ring-shaped portions defining running tracks for said first and second races, respectively, and means detachably holding said first and second elements together, said second member having a unitary portion on which running tracks for said first and second races are formed, said second member having a radially extending mounting flange on one side thereof, said first and second elements having aligned axially extending hole means distributed about their circumference for mounting said bearing assembly, the hole means of the one of said first and second elements toward said flange being threaded.



4,138,170

CAGELESS BALL OR ROLLER BEARING

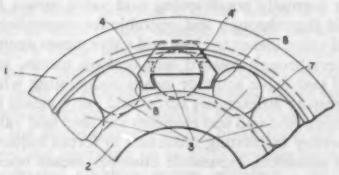
Gunter Markfelder, and Heinrich Hofmann, both of Schweinfurt, Fed. Rep. of Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Nov. 11, 1977, Ser. No. 850,804

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 2651827

Int. Cl.² F16C *19/00*

U.S. Cl. 308—195 **8 Claims**



1. A bearing unit comprising:

a pair of coaxial rings forming respective track surfaces separated by an annular gap;

a multiplicity of rotary bodies disposed in an annular array in said gap, one of said track surfaces being formed with an annular lodgment defining a fixed relative axial position of said bodies, the other of said track surfaces being unobstructed on at least one side of said array to facilitate the initial assembly of the unit; and

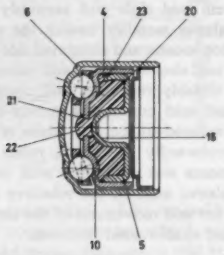
holding means including a plurality of substantially identical, mutually unconnected retaining elements each embracing a single one of said bodies, said retaining elements being each provided with integral extensions holding same spaced apart with a separation accommodating at least one intervening rotary body, said other of said track surfaces and said retaining elements being provided with interfitting formations whereby said rings are held in a substantially fixed relative axial position.

4,138,171

AXIALLY SUPPORTED THRUST BEARING

Heiarich Kunkel, Schweinfurt; Rainer Schurger, Schwanfeld, and Otto Matyschik, Nuedlingen, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 2, 1977, Ser. No. 764,976
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1976, 7603043[U]
Int. Cl.[2] F16D *23/14*
U.S. Cl. 308—233 16 Claims



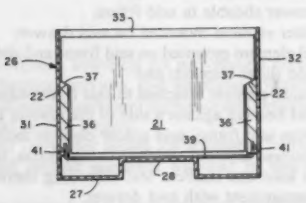
1. In a rolling element thrust bearing, formed with thin-walled housing race and shaft race members, said housing race being cup-shaped and enveloping said shaft race with radial clearance, said shaft race including two parts, slipped one into the other telescope-fashion, and having axially extending side walls joined to radially extending center walls, one of said parts incorporating the race for said rolling elements, said rolling elements being arranged between the race members, the other of said parts having a central depression in its center wall for accommodating means adapted to apply pressure thereon, the improvement wherein said center walls of said shaft race member are axially spaced apart and further comprising elastic means arranged between said two center walls of said shaft member for axially supporting said parts relative to each other and holding said center walls fully spaced apart at least in the absence of axial forces on said bearing.

4,138,172

HANGING CARD STORAGE SYSTEM

Robert S. Hansen, 2 E St., Santa Rosa, Calif. 95404

Filed Dec. 19, 1977, Ser. No. 861,979
Int. Cl.[2] A47B *63/00*; B42F *15/00, 17/02, 17/08*
U.S. Cl. 312—184 10 Claims



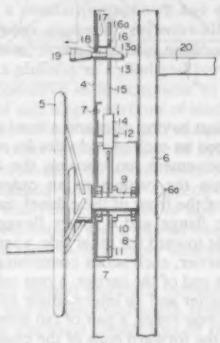
1. In a card storage system: a receptacle having a pair of spaced apart generally parallel side walls, downwardly and inwardly inclined upwardly facing surfaces extending longitudinally of the side walls, and a plurality of cards having downwardly and inwardly inclined lateral edge portions engaging the inclined surfaces above the centers of gravity of the cards, the relative vertical dimensions of the receptacle and cards being such that the cards are suspended freely from the upwardly facing surfaces in an upright position with the lower edge portions of the cards spaced above the bottom wall of the receptacle.

4,138,173

DEVICE FOR ANCHORING MOVABLE BOX-SHAPED SHELF ASSEMBLY

Genshi Taniwaki, Kumamoto, Japan, assignor to Kongo Co., Ltd., Kumamoto, Japan

Filed Nov. 16, 1976, Ser. No. 742,357
Claims priority, application Japan, Mar. 23, 1976, 51-6177[U]
Int. Cl.[2] A47B *87/00*
U.S. Cl. 312—198 6 Claims



1. A device for anchoring a movable shelf assembly comprising a shelf assembly supported on wheels which ride on spaced apart parallel rails laid on a floor;

a manually operable drive means carried at the outer end of a shaft extended through a side wall of said shelf assembly;

a power transmission mechanism including reduction gear means for transmitting the rotation of said shaft of said drive means to a shaft of said wheels;

a toothed locking wheel carried by said shaft of said drive means for rotation in unison therewith;

locking means disposed for vertical movement and capable of dropping by its own weight into a space between teeth of said toothed locking wheel;

an operating member having its lower end securely connected to the upper end of said locking means and disposed for vertical movement;

wedge means slidably fitted into a guide hole formed through said operating member, said wedge means being reciprocably and slidably movable in a direction perpendicular to the axis of said operating member so that the latter is caused to move vertically; and

a locking knob for sliding said wedge means securely fixed to said wedge means and extended through said side wall outwardly thereof;

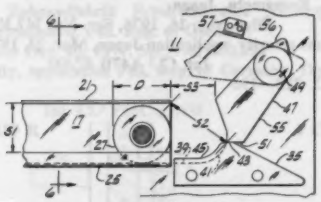
wherein said wedge means includes a hypotenuse surface, said hypotenuse surface being directed upwardly and inclined downwardly, and a vertex surface, said vertex surface being directed upwardly and extending horizontally, wherein when said locking knob is in one position for causing said wedge member to hold said operating member and said locking means in an unlocked position, said upwardly directed horizontally extending vertex surface is brought into contact with the upper side of said guide hole, and when said locking knob is in another position for causing said wedge member to allow said operating member and said locking means to drop into a locking position, said upwardly directed, downwardly inclined surface is brought into slidable contact with the upper side of said guide hole of said operating member.

4,138,174

VENDOR HAVING SLIDING TRAYS AND LATCHES THEREFOR

Robert N. Cox, St. Louis County, and Albinus G. Bodoh, Blackjack, both of Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Filed May 12, 1978, Ser. No. 905,375
Int. Cl.[2] A47B *88/16*
U.S. Cl. 312—333 **3 Claims**



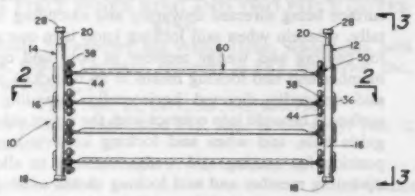
1. In a cabinet having sides and a front door, a carrier, a pair of channels, one on each of said sides for supporting the carrier for sliding movement, on opening the door, from an inner position within the cabinet to an outer position extending forward out of the front of the cabinet, each channel comprising an upper flange and a lower flange extending from its respective side toward the other side, a series of rollers on each side of the carrier, each series comprising a front roller adjacent the front end of the carrier, a rear roller adjacent the rear end of the carrier and an intermediate roller between the forward and the rear roller, a pair of rail members, one on each of said sides, at the forward ends of the channels, each rail member having a rear upper surface portion generally flush with the lower flange of the respective channel and a forward upper surface portion which progresses upwardly in forward direction from said rear upper surface portion to a peak, each peak being spaced from the forward end of the upper flange of the respective channel, each of the rollers of the carrier being of a diameter less than the distance between the peak and the forward end of the upper flange at that side, a latch for the carrier in one of the sides of the cabinet above the rail member at that side, means mounting the latch for pivotal movement between a latching position for preventing withdrawal of the carrier and an unlatching position permitting withdrawal of the carrier, said latch when in latching position acting in conjunction with the forward edge of the upper flange at said one side to confine a roller on the carrier at that side against upward movement away from the rear upper surface portion of the respective rail member, and said latch when in unlatching position permitting a roller on the carrier at that side to roll upwardly and forwardly over the peak of its corresponding rail member.

4,138,175

FREEZER ORGANIZER

Donald R. Tattershall, P.O. Box 7546, Tulsa, Okla. 74105

Filed Aug. 23, 1976, Ser. No. 716,977
Int. Cl.[2] A47B *51/00*
U.S. Cl. 312—270 **5 Claims**



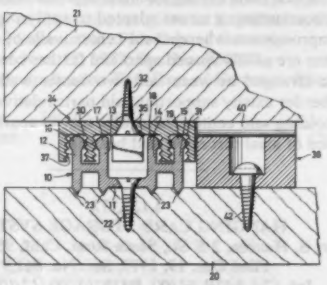
1. Space saving and organizing means for a refrigerator compartment and comprising a plurality of roller means adjustably secured in said compartment, vertical adjustment means provided in said compartment providing selective vertical spacing of said roller means, slide rod assembly means carried by each of said roller means and reciprocally slidable in said compartment, shelf means supported by each of said slide rod assembly means, and connecting means cooperating between said shelf means and respective slide rod assembly means for facilitating movement of said shelf means between a normal retracted storage position within said compartment and an extended cantilevered position with respect to said compartment for access to substantially the entire upper surface of the shelf wherein said slide rod assembly means comprises an elongated sleeve member having the opposite ends thereof closed by stop means, and elongated slot means provided in the sidewall of said sleeve member and extending between the stop means for slidably receiving said cooperating means therethrough, and said connecting means comprises arm means adjustably secured to the side edges of said shelf means and extending outwardly therefrom, roller means journalled on said arm means and engagable with inner perphery of said elongated sleeve member for selective movement therealong to provide for said movement of the shelf means between the retracted and cantilevered positions.

4,138,176

DRAWER MOUNTING ARRANGEMENT

Thorp C. Cowdroy, Balgowlah, Sydney, Australia, assignor to Clive Investments Pty Limited, Balgowlah, Australia

Filed May 2, 1977, Ser. No. 792,534
Claims priority, application Australia, May 7, 1976, 5852/76
Int. Cl.[2] A47B *88/04, 88/12*
U.S. Cl. 312—341 NR **2 Claims**



1. A drawer mounting arrangement comprising:
a drawer frame;
a drawer slidable in said frame;
a slider element mounted on said drawer;
a rail element mounted on said frame and slidably supporting said slider element; and
a spacer element attached to said frame adjacent to said rail, and bearing against a side of the drawer to keep it spaced from said frame, said spacer element including a block of resilient material attached to said frame, said block having at least one resilient leaf extending therefrom for sliding engagement with said drawer.

4,138,177

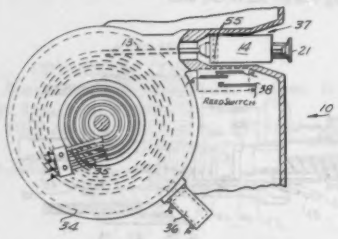
SAFETY VEHICLE POWER DISTRIBUTION SYSTEM

Andrew F. van Valer, P.O. Box 87, Grass Valley, Calif. 95945

Continuation of Ser. No. 677,532, Apr. 16, 1976, abandoned.
This application Apr. 27, 1977, Ser. No. 791,556
Int. Cl.[2] H01R *13/60, 13/62*
U.S. Cl. 339—8 RL **8 Claims**

1. A safety vehicle power distribution system for supplying electrical power to a vehicle when the vehicle is parked and

for automatically physically disconnecting the system comprising a source of electrical power, cable means connecting the vehicle to the source of power, a connector on the end of the cable nearest the power source for attachment to the power source, means within the connector for physically separating the connector from the source of power, and power activated means on the vehicle for drawing in and storing the cable when the connector and power source have been separated, said



power activated means comprising a take up reel having centrally disposed plural contact switches which complete the circuit at all times, brake means disposed on said reel which is selectively energized to constrain said take up reel, said connector being provided with magnetic elements which serve as an indicator that the connector and cable have been completely taken up, and means on said take up reel to sense the presence of said magnetic elements to engage said brake.

4,138,178

DIVER'S COMPOSITE UMBILICAL

Barry E. Miller; D. Wayne McClain, and William W. McCrory, Jr., all of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 16, 1977, Ser. No. 852,120
Int. Cl.² H01R *3/04*
U.S. Cl. 339—15 **7 Claims**

1. A composite diver's umbilical for providing a diver with both fluid and electrical services, said umbilical comprising:

at least first and second umbilical segments each having fluid and electrical service means;

first and second connector means for releasably connecting said first and second segments together in end-to-end relation;

said connector means being cooperative to simultaneously effect coupling of the fluid and electrical service means of one of said segments to the fluid and electrical service means, respectively, of the other of said segments;

said segments each comprising a plurality of flexible hoses, including at least an outermost hose and an innermost hose, arranged substantially coaxially and defining a plurality of fluid passages as said fluid service means, said hoses comprising walls formed of a flexible, electrically insulative material;

said electrical service means comprising electrical conductor means embedded in the wall of at least one of said hoses;

said first connector means comprising a rigid nipple member having a central passageway and a plurality of arcuate passageways arranged concentrically about said central passageway, said nipple member presenting at one end thereof a plurality of cylindrical nipple portions of stepped diameters, said nipple member presenting at its other end a second plurality of cylindrical portions of stepped diameters on which hoses of one of said segments are engaged with their lumens in communication with respective ones of said passageways of said nipple member, and a first flange extending radially from said nipple member between the ends thereof;

said second connector means comprising a rigid receptacle member having a central passageway and a plurality of arcuate passageways arranged concentrically about said central passageway, said receptacle member defining at one end thereof a plurality of cylindrical bores of stepped diameters and operative as a receptacle to receive said nipple portions of said nipple portions of said nipple member of said first connector means, said receptacle member presenting at its other end a plurality of cylindrical portions of stepped diameters on which hoses of one of said segments are engaged with their respective lumens in communication with respective ones of said passageways of said receptacle member, and a second flange extending radially from said receptacle member substantially at said one end thereof;

cooperable first and second electrical connector elements mounted on said first and second flanges, respectively, and connected to the electrical conductors of the respective hoses;

collar means for clamping at least the outermost hose to each of said nipple and receptacle members; and

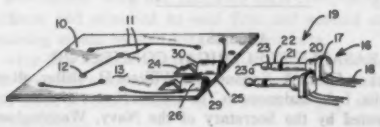
coupling means for releasably securing said nipple and receptacle members together with said nipple portions received in said receptacle bores, and with said first and second electrical elements in cooperative engagement.

4,138,179

COAXIAL JACK FOR PRINTED CIRCUIT BOARDS

Curtis H. Miller, Burnsville, and Robert A. Arp, Eden Prairie, both of Minn., assignors to Med General, Inc., Minneapolis, Minn.

Filed Dec. 20, 1977, Ser. No. 862,345
Int. Cl.² H05K *1/12*
U.S. Cl. 339—17 LC **4 Claims**



1. In combination with a printed circuit board having a pattern of printed conductors on at least one surface and at least one aperture located inwardly a predetermined distance from one side edge thereof, a female terminal for cooperating with a male coaxial jack-type connector of the type including first and second coaxially aligned conductive cylindrical elements separated by a cylindrical insulating element and an annular notch formed in said second conductive cylindrical element, comprising:

a. a sleeve of conductive material having a generally U-shaped cross-section, the spacing between the legs of said U-shaped sleeve being equal to the diameter of said first cylindrical element and a length approximately equal to said predetermined distance, affixed to said printed circuit board on a first side thereof with a first open end of said sleeve generally aligned with said one side edge of said

printed circuit board and the other open end of said sleeve generally aligned with an edge of said aperture; and

b. a leaf-type spring having first, second and third integrally formed segments, said first segment being approximately equal in length to said predetermined distance and affixed to said printed circuit board on the side thereof which is opposite to said first side and at a point proximate said one side edge, said second segment being bent at an oblique angle to said first segment to pass through said aperture and extend in front of said other open end of said sleeve, and said third segment being bent at an oblique angle with respect to said second segment and extending toward, but short of said first side of said printed circuit board.

4,138,180

PLUG

Raymond Bernier, Vincennes, France, assignor to Bernier et Cie, Paris, France

Filed Jan. 25, 1978, Ser. No. 872,182
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—95 R **3 Claims**

1. In a plug of the kind comprising a first element having at least one pin and a second element having at least one socket designed to take the pin, the improvement that the pin is cylindrical in shape and has an enlarged ogival end, the socket having a square-section hole, the diameter of the circle inscribed in said hole being substantially equal to the maximum diameter of the enlarged end of the pin.

4,138,181

RELEASABLE ELECTRICAL CONNECTOR

John R. Hacker; Chris W. Krohne, and William H. Miller, all of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1978, Ser. No. 899,945
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—45 R **12 Claims**

1. A releasable connection for electrical conductors comprising,

interengageable plug and receptacle components each including an electrical insulator supporting at least one electrical contact member arranged for interconnection when said plug and receptacle components are brought into interengagement,

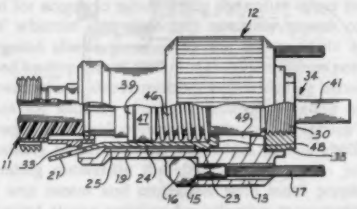
locking means on said receptacle component,

a plug shell concentrically surrounding said electrical insulator in said plug component,

a cylindrical sleeve movably positioned in said plug shell, said cylindrical sleeve having one end slotted to provide a plurality of separated sections at least two of which are flared outwardly beyond the normal diameter of said cylindrical sleeve,

locking means on said at least two outwardly extending flared sections arranged for engagement with said locking means on said receptacle component,

compressing means in said plug shell for compressing said outwardly extending flared sections to maintain engagement of said locking means on said receptacle component with said locking means on said at least two outwardly extending flared sections, and



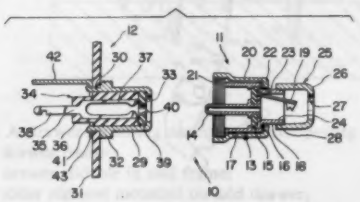
spring means for biasing said movable cylindrical sleeve into a position whereby said outwardly extending flared sections are compressed to keep said locking means on said plug and said locking means on said receptacle engaged with one another until a separating force between said plug and receptacle components becomes sufficiently large to compress said spring means and move said cylindrical sleeve a sufficient distance so that said flared sections clear said compressing means thereby unlocking said locking means on said receptacle component from said locking means on at least two outwardly extending flared sections.

4,138,182

PIN TYPE JACK-AND-PLUG COUPLING DEVICE

Hiroshi Muratsuka, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1977, Ser. No. 807,130
Int. Cl.[2] H01R *13/54, 17/18*
U.S. Cl. 339—89 M **4 Claims**



1. A coupling device comprising:

a first mating member having a first pin connecting member;

a second mating member having a second pin connecting member, said first and second mating members being adapted to be joined together by inserting said first pin connecting member into said second pin connecting member;

means for tightening said first and second mating members together through a threaded connection after they have been joined comprising a first hollow cylindrical member fixed around one of said mating members and having external threads thereon and a second hollow cylindrical member disposed rotatably around but captivated on the other of said mating members and having internal threads therein which are adapted to engage said external threads; and

means for releaseably retaining said tightening means lockingly in place comprising a third hollow cylindrical mem-

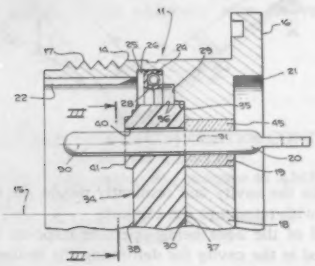
ber having internal threads therein, said other mating member having an annular shoulder and external threads thereon adapted to engage said internal threads in said third cylindrical member, and said second cylindrical member having an annular flange adapted to be releaseably locked between said annular shoulder and said third cylindrical member.

4,138,183

CRYOGENIC CONNECTOR

William B. Soos, Woodland Hills, Calif., assignor to G&H Technology, Inc., Santa Monica, Calif.

Filed Jun. 21, 1976, Ser. No. 697,916
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—94 M **8 Claims**



1. In an electrical connector for use under cryogenic conditions and including a receptacle means having a receptacle shell and plug means having a plug shell receivable within the receptacle shell, a coupling means carried by the plug means for releasably connecting the receptacle shell and plug shell, the combination of:

a body member of relatively hard dielectric material within said plug shell, said body member having through holes for electrical contact elements,

an outwardly flaring surface at one end of each hole;

a seal member of flowable elastomeric dielectric material within said receptacle shell, said seal member having through holes for containing contact pins,

a projecting boss at one end of each hole in said seal member for cooperable circular sealing contact with said outwardly flaring surface of an opposed aligned hole in said body member;

spring means on said plug means operable to cause flow of and to place said elastomeric seal member under axially directed compression throughout the operating temperature range of the conductor to maintain said circular sealing contact;

said body member and seal member having a common axis;

the material of said body member, seal member, said contact pins having different coefficients of thermal expansion and contraction,

said seal member being inelastic at a cryogenic temperature;

the diameters of the holes of said seal member and the distance of the axes of said holes from said common axis having oversize dimensions relative to said pins, the axes of said holes and pins received therein at ambient temperature being noncoincident and being coincident at cryogenic temperatures where said seal member is inelastic,

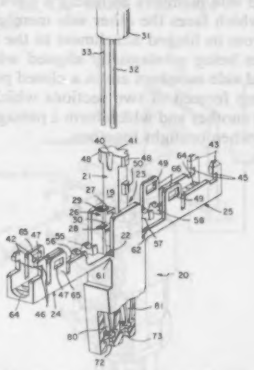
tension forces acting on said seal member during change in temperature being thereby reduced and less than the elastic limit of said elastomeric material at such cryogenic temperature.

4,138,184

TERMINATING MEANS FOR A MULTI-WIRE CABLE

Chauncey D. Knopp, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 6, 1978, Ser. No. 883,564
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—97 P **12 Claims**



1. A connector for terminating at least a pair of wires extending from a cable and comprising a housing and contact retained in said housing;

said housing comprising:

a first housing portion having first and second surfaces formed on opposite sides thereof; and

first and second channel-like contact retaining means formed on and extending along a first portion of each of said flat surfaces;

said contact means each having first and second ends and each comprising at said first end thereof a first means for connecting to an external conductive element and at the second end thereof a second means for connecting to one of said wires;

said second means comprising a plate-like element extending away from said first surface of said housing portion and having a slot means formed thereon which opens onto an edge of said plate-like element which is positioned away from said first housing portion;

said housing further comprising;

hinge-like members;

first and second wing-like elements each comprising third surfaces and attached to said first and second contact retaining means by said hinge-like members;

said wing-like members further constructed to pivot about said hinge-like members to close upon each other with said third surfaces facing each other to grip the cable therebetween;

said wing-like elements further each comprising pusher elements formed on said third surfaces and which become positioned adjacent said plate-like elements when the wing-like elements are in their closed position to push said wires into said slot means in said plate-like elements; and

means for maintaining said wing-like elements in their closed positions.

4,138,185

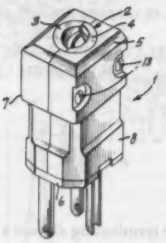
ELECTRIC CORD CLAMP DEVICE

Frank C. Jaconette, Jr., Trumbull, Conn., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Filed Oct. 4, 1977, Ser. No. 839,205
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—107 **16 Claims**

1. An electrical terminal unit comprising:

a front member containing apertures for the passage of conductive members,
two side members hingedly attached to said front member,
each of said side members being pivotally movable about its hinged attachment to a closed position abutting the other side member and enclosing the back of the front member, and to an open position giving access to the back of the front member,
each of said side members including a cavity in its interior surface which faces the other side member, at a location spaced from its hinged attachment to the front member,
said cavities being substantially aligned with one another when said side members are in a closed position, and
a cord clamp formed of two sections which are separable from one another and which form a passage for an electrical cord when brought together,



each of said sections being snugly, but removably, engaged in one of said cavities to remain in said cavity when said side members are in an open position and to be brought together in facing relationship with the other section, to provide a clamping engagement about an electrical cord, when said side members are in a closed position,
each of the cavities including one or more guideways extending in a direction away from the interior face of the side member,
each of said cord clamp sections including one or more flanges each dimensioned to fit into one of said guideways, whereby said sections may be removably inserted into said cavities, and
at least one surface irregularity between the adjoining surfaces of each guideway and the associated flange for providing a snug fit between said adjoining surfaces.

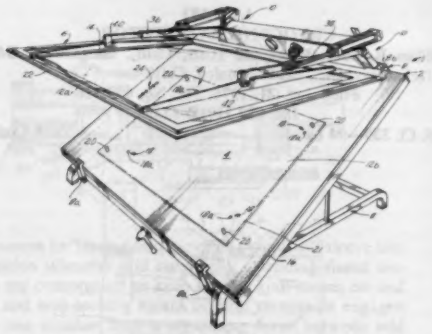
4,138,186

TEST APPARATUS

Everett J. Long, Claremont, and Elmer W. Muench, Covina, both of Calif., assignors to Everett/Charles, Inc., Pomona, Calif.

Continuation-in-part of Ser. No. 818,206, Jul. 22, 1977, Pat. No. 4,108,528, which is a continuation of Ser. No. 747,611, Dec. 6, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 851,847
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—117 P **18 Claims**

1. Test apparatus for making electrical contact with plural test points on at least one of two oppositely facing sides of a planar test member comprising:
a test member support having a test location;
a door for opening and closing access to the test location;
the door and support comprising, when the door is closed, a substantially closed cavity therebetween encompassing the test location, the door and the support each comprising one of two opposing walls of said cavity;
an array of relatively spaced electrically conductive probes mounted in and extending through the wall of the support, each of said probes comprising an end exposed exterior to the cavity and a probe head electrically connected on the opposite end which is exposed in the cavity, said probe heads each being resiliently biased away from the wall of the support to a substantially common plane and movable under pressure towards the wall of the support;
locator means on the support for locating such test member in the test location, said locator means being adapted for guiding a location test member toward and away from the wall of the support; and
a vacuum port through the support to the cavity;
said door comprising a resilient seal extending around the perimeter of the cavity between the wall of the door and the support, when the door is closed, to thereby form a



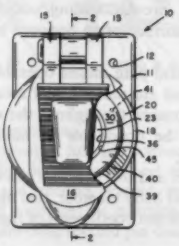
seal for the cavity and resiliently mount the wall of the door with respect to the support;
the wall of the door being operable response to vacuum applied in the cavity for deforming the resilient seal and applying a substantially uniform pressure against a side of such test member, located by the locating means, and thereby apply pressure through such a test member to the probe heads, the probe heads moving under the pressure applied thereto until all probe heads make electrical contact with such a test member.

4,138,187

LIFT COVER ASSEMBLY FOR ELECTRICAL WIRING DEVICE

Flemming Brygger, Guilford, Conn., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Filed Dec. 12, 1977, Ser. No. 859,299
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—117 R **21 Claims**



1. A member composed of an elastomeric material for shielding and sealing the interior of an electrical assembly against the entry of liquids, the assembly including a lift cover pivotally mounted on a flat cover plate having a substantially circular opening therein defined by a substantially circular interior plate edge, the front face of a first electrical wiring device communicating with the opening, said member comprising:
a sealing section comprising two substantially parallel portions extending radially outwardly from an axis which extends substantially perpendicularly to said plate cen-

trally of said opening, at least one of said portions bearing against a surface of said plate adjacent the plate edge thereof, and a lateral portion for joining said portions and holding said portion in liquid-sealing contact with said plate surface,

a first axially compressible shielding section joined to the frontwardmost one of said portions to extend outwardly and frontwardly therefrom,

a second axially compressible shielding section joined to, and extending frontwardly of, said first shielding section along a common peripheral edge, said second shielding section inclined inwardly toward said axis to define a radial aperture of sufficient size to accommodate therein a second wiring device electrically connected to the first wiring device,

the first and second sections having interior surfaces of oppositely directed slope which intersect to form a liquid-collecting trough therebetween, and

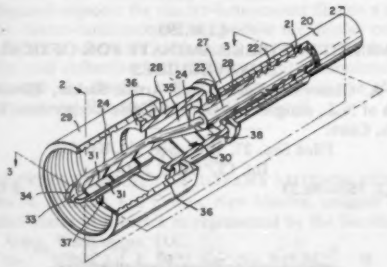
at least one aperture extending through one of the flexible sections adjacent said peripheral edge for venting the trough.

4,138,188

COAXIAL CABLE PLUG WITH CENTER CONDUCTOR AS CENTER CONTACT

Suel G. Shannon, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 21, 1977, Ser. No. 862,712
Int. Cl.[2] H01R *17/18*
U.S. Cl. 339—177 E **14 Claims**



1. A plug termination for terminating a coaxial cable having a center conductor and an outer conductor with an insulative spacer therebetween, and with said plug comprising:

ferrule means having a first aperture extending therethrough and with a first end portion thereof inserted between said outer conductor and said insulative spacer and further with a portion of said insulative spacer having the center conductor retained therein being positioned in said first aperture at said first end of said ferrule means; and

dielectric spacer means positioned within the second end of said ferrule means and comprising a main body portion having a second aperture formed therein, with the center conductor of said cable extending through said second aperture to a first end of said main body portion of said dielectric spacer means;

said dielectric spacer means further comprising a rod-like member having a free end and extending from said first end of said main body portion and further having a groove formed on the surface of said rod-like member which extends from said second aperture and contains therein a portion of said center conductor of said cable to form a center conductor contact;

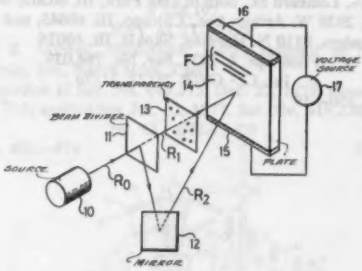
the depth of at least a portion of said groove being less than the diameter of said center conductor.

4,138,189

HOLOGRAPHY USING A $Bi_{12}SiO$ OR $Bi_{12}GeO_{20}$ RECORDING MEDIUM

Jean-Pierre Huignard; Jean-Pierre Herriau, and Francois Micheron, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 1, 1977, Ser. No. 812,599
Claims priority, application France, Aug. 19, 1976, 76 25231
Int. Cl.[2] G03H *1/02, 1/26*
U.S. Cl. 350—3.64 **8 Claims**



1. A holographic storage cell for storing volume holograms comprising:

a plate of sensitive material having a face, said sensitive material chosen from the group consisting of Bi_{12} Si O_{20} and Bi_{12} Ge O_{20} and having a preferred crystalline axis; and

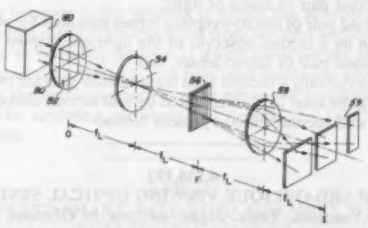
means for producing a transverse electric field in said plate, said field being parallel to said preferred axis and perpendicular to a given direction, producing fringes substantially parallel to said direction.

4,138,190

GEOMETRICAL TRANSFORMATIONS IN OPTICS

Olof Bryngdahl, Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 544,526, Jan. 27, 1975, abandoned. This application Sep. 24, 1976, Ser. No. 727,304
Int. Cl.[2] G02B *5/32*; G03H *1/08*; G02B *27/38*
U.S. Cl. 350—3.70 **1 Claim**



1. A method for providing optical geometric transformations of an information conveying object distribution at a first plane such that the information is discernable in a stretched form at a second plane comprising the steps of:

forming an object distribution at said first plane,

interposing a lens element between the object distribution and said second plane, said lens element being separated from the object distribution and said second plane by a distance equal to its focal length, and

positioning a transformation hologram having a predetermined varying phase profile substantially different from said object distribution adjacent said object distribution at said first plane, said predetermined varying phase profile

corresponding to a desired stretching transformation, the object distribution being stretched by the phase variation of said transform and said lens element producing at said second plane a light distribution which corresponds to the desired stretched transformation.

4,138,191

OPERATING MICROSCOPE WITH TWO PAIRS OF STEREO EYE-PIECE LENSES

Gholam A. Peyman, 1044 N. Oak Park Ave.; Jeffrey E. Koziol, 1213 N. Lombard St., both of Oak Park, Ill. 60302; Walter I. Fried, 2938 W. Arthur Ave., Chicago, Ill. 60645, and Donald R. Sanders, 8110 N. Harding, Skokie, Ill. 60076

Filed Apr. 4, 1977, Ser. No. 784,039
Int. Cl.[2] G02B *21/22, 21/36*
U.S. Cl. 350—19 **2 Claims**

1. A dual stereo-microscope for performing micro-surgery comprising:

an objective lens positioned to view an operating area and on a first line effective to develop a collimated beam of light from said operating area;

a first pair of stereo-lenses disposed in and normal to said collimated beam and adapted to intercept and develop a first pair of tracts of light;

a first pair of stereo-eyepiece lenses mounted for observation by a surgeon of the light intercepted by said first pair of stereo-lenses;

meaans defining a first light transmission path for transmitting the total light intercepted by said first stereo-lenses to said first stereo-eyepiece lenses;

a second pair of stereo-lenses disposed in and on a second line normal to said collimated beam and perpendicular to said first line and adapted to intercept and develop a second pair of tracts of light;

a second pair of stereo-eyepiece lenses mounted for observation by a second observer of the light intercepted by said second pair of stereo-lenses; and

means defining a second light transmission path for transmitting the total light intercepted by said second stereo-lenses of said second stereo-eyepiece lenses.

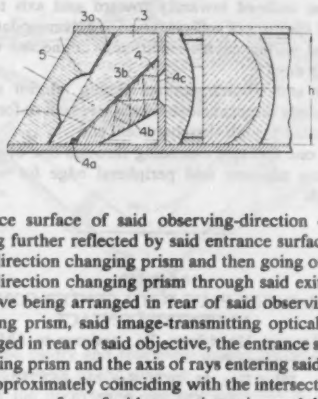
4,138,192

FOWARD-OBLIQUE VIEWING OPTICAL SYSTEM

Nobuo Yamasita, Tama, Japan, assignor to Olympus Optical Company, Tokyo, Japan

Continuation-in-part of Ser. No. 531,742, Dec. 11, 1974, abandoned. This application Feb. 4, 1977, Ser. No. 765,754
Claims priority, application Japan, Dec. 13, 1973, 48/138081
Int. Cl.[2] G02B *23/02*
U.S. Cl. 350—25 **4 Claims**

1. A forward-oblique viewing optical system for endoscopes comprising a correcting prism, a concave lens arranged in front of said correcting prism, an observing-direction changing prism, an objective and an image-transmitting optical element, said correcting prism having an entrance surface arranged perpendicular to the oblique-viewing direction of the endoscope which is inclined at an angle substantially less than 75° in respect to the forward-viewing direction of the endoscope and an exit surface inclined in respect to the forward-viewing direction with an angle of inclination smaller than that of said entrance surface, said observing-direction changing prism having an entrance surface opposed to said exit surface of said correcting prism and separated therefrom, a reflecting surface inclined in respect to the forward-viewing direction by an angle of inclination smaller than that of said entrance surface of said observing-direction changing prism and an exit surface arranged perpendicular to the optical axis of said objective system rays entering said observing-direction changing prism being reflected by said reflecting surface and directed toward



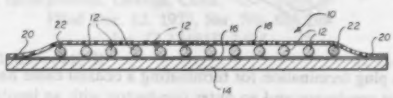
said entrance surface of said observing-direction changing prism, being further reflected by said entrance surface of said observing-direction changing prism and then going out of said observing-direction changing prism through said exit surface, said objective being arranged in rear of said observing-direction changing prism, said image-transmitting optical element being arranged in rear of said objective, the entrance surface of said correcting prism and the axis of rays entering said correcting prism approximately coinciding with the intersecting point of said entrance surface of said correcting prism and the optical axis of said objective.

4,138,193

MULTIPLE FIBER LAMINATE FOR OPTICAL WAVEGUIDES

Jerzy A. Olszewski, Edison, and Arnab Sarkar, Piscataway, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Sep. 27, 1977, Ser. No. 837,015
Int. Cl.[2] G02B *5/16*
U.S. Cl. 350—96.23 **8 Claims**



1. An optical fiber laminate including in combination a first tape, a pressure sensitive adhesive on one of the broad surfaces of the tape, an optic fiber adhered to the tape by the pressure sensitive adhesive, a covering tape overlying the optic fiber and secured to the first tape along the edges of the tapes, and elongated elements on the first tape between the optic fiber and both edges of the tapes and holding the covering tape out of contact with the sides of the optic fiber so as to avoid assymetric pressure of the covering tape on the optic fiber.

4,138,194

LOW ATTENUATION OPTICAL FIBER OF DEUTERATED POLYMER

John K. Beasley, Greenville; Richard Beckerbauer, Wilmington, both of Del.; Henry M. Schleinitz, Kennett Square, Pa., and Frank C. Wilson, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 14, 1977, Ser. No. 842,301
Int. Cl.[2] G02B *5/14;* B32B *27/02*
U.S. Cl. 350—96.30 **13 Claims**

1. An optical fiber comprising a core and cladding which

consist essentially of organic high polymers, said core being a deuterated acrylate polymer and containing less than 20 mg of hydrogen per gram of polymer as measured by nuclear magnetic resonance of 60 MHz.

4,138,195

ELECTRO-OPTIC PASSIVE DISPLAY DEVICE

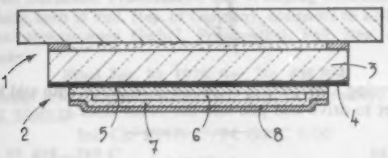
Eric Saurer, Bevaix, and Maurice Grimm, Neuchatel, both of Switzerland, assignors to Ebauches S.A., Canton of Neuchatel, Switzerland

Filed May 5, 1977, Ser. No. 794,016

Claims priority, application Switzerland, May 13, 1976, 5998/76

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—345 **13 Claims**



1. An electro-optic passive display device comprising:

a display cell; and

a lighting device attached to the display cell on a first side of the display cell opposite the viewing side of the display cell, said lighting device including a transparent electro-luminescent film disposed adjacent said first side of the display cell, said lighting device also including an activation electrode to activate the electro-luminescent film disposed adjacent the electro-luminescent film on a side of the electro-luminescent film opposite the display cell, the activation electrode activating the electro-luminescent film and reflecting and diffusing light transmitted to it through the display cell and emitted from the electro-luminescent film back to said display cell.

4,138,196

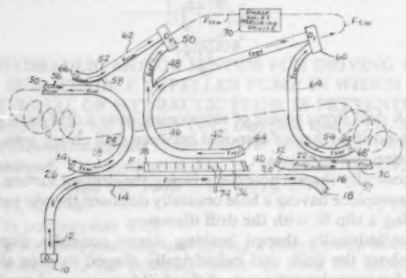
FIBER INTERFEROMETER ROTARY MOTION SENSOR

Charles M. Redman, Las Cruces, New Mexico, assignor to the United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 6, 1977, Ser. No. 813,362

Int. Cl.[2] G01B *9/02*

U.S. Cl. 356—350 **10 Claims**



1. A rotary motion sensor, which comprises:

means for generating a coherent optical signal at a first frequency;

a multiple-turn fiber interferometer coupled to receive said coherent optical signal from said generating means and having first and second ends for respectively transmitting said coherent optical signal in first and second opposed directions therein;

means coupled to receive said coherent optical signal from said multiple-turn fiber interferometer and said reference optical signal from said means for generating same for mixing said coherent optical signals transmitted in said first and second directions with said reference optical signal to produce first and second signals each at said second frequency; and

means coupled to receive the output from said mixing means for detecting the relative phase shift between said first and second signals.

4,138,197

KEY ACTUATOR

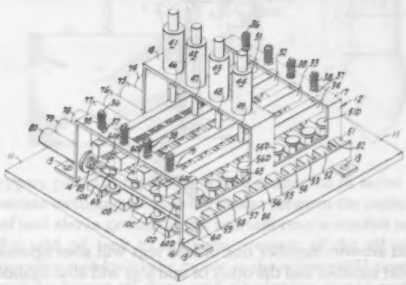
Darrell B. Minton, Sebastapol, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.

Continuation of Ser. No. 643,373, Dec. 22, 1975, abandoned.

This application Jul. 22, 1977, Ser. No. 818,236

Int. Cl.[2] B41J *5/08*

U.S. Cl. 400—474 **3 Claims**



1. In apparatus for selectively depressing keys arranged in an array of intersecting rows and columns: an operating bar aligned with each column of keys and movable between advanced and retracted positions relative to the keys, a carrier aligned with each row of keys and movable in a direction parallel to the row, a plurality of key actuating members carried by each carrier and movable between advanced and retracted positions relative to the keys, said actuating members being positioned between the operating bars and the keys for transmitting motion from the operating bars to the keys when aligned therewith, means for slectively moving each of the carriers between a rest position in which the actuating members carried thereby are displaced from the keys and operating bars and an operating position in which the actuating members are aligned with the keys and bars, and means for selectively moving the operating bars to their advanced positions to advance the actuating members and depress the keys aligned therewith.

4,138,198

TAPERED SHANK BALL STUD ASSEMBLY WITH COLLAPSIBLE WASHER

Trevor J. Brown, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

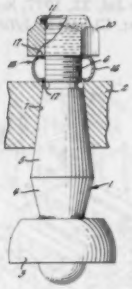
Filed Jul. 18, 1977, Ser. No. 816,259

Int. Cl.[2] F16B *9/02*; F16C *11/06*

U.S. Cl. 403—247 **4 Claims**

1. In an articulated joint assembly including a tapered shank ball stud, a support member having a tapered aperture therethrough to receive the tapered shank of said ball stud in seated engagement therewith and, a nut having internal threads in engagement with the external threads on the free end shank portion of said ball stud, said nut being provided with a self-locking deformable means associated with said internal threads located in said nut so as to engage the external threads of said ball stud after a predetermined threaded engagement of said

nut onto said ball stud, the improvement comprising a washer positioned to loosely encircle the shank of said ball stud between said support member and said nut, said washer in its original, as assembled, configuration on said ball stud being a ring-like collapsing washer of C-shaped annulus configuration having an annular arcuate bight connecting together a pair of annular curved legs, each said leg extending radially inward from said bight and having its free, internal end of a configuration so that during collapse of said washer said end of one said leg will move toward the other of said legs, the major axial extent between said legs in the original configuration of said washer being preselected relative to the threaded end of said ball stud extending outward from said member so that with said tapered shank substantially seated in said tapered aperture



in said support member one of said legs will abut against said support member and the other of said legs will abut against said nut when it is partly threaded onto said ball stud prior to said self-locking means engaging said external threads of said ball stud, whereby as said nut is driven down said ball stud, said collapsing washer will effect axial movement of said ball stud whereby said tapered shank becomes fully seated in said tapered aperture of said support member locking said ball stud against rotation relative to said support member whereby said nut can be fully torqued down to effect collapsing of said washer substantially about the axial midpoint of said bight so that said legs come into abutment against each other in sandwiched relation between said support member and said nut, said washer as thus collapsed being of flat ring-like washer configuration.

4,138,199

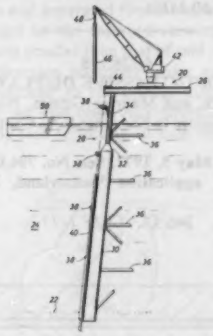
METHOD OF DRIVING PILES UNDERWATER

George J. Gendron, Houston, and Lindsey J. Phares, Sugarland, both of Tex., assignors to Raymond International, Inc., Houston, Tex.

Filed Nov. 19, 1976, Ser. No. 743,227
Int. Cl.[2] E02D *5/74*
U.S. Cl. 405—232 11 Claims

1. In a method for securing an offshore structure to an ocean floor by driving a plurality of elongated piles into the ocean floor, said structure having a plurality of legs with a plurality of annular guide sleeves spaced along the legs for guiding the piles to the ocean floor and for supporting the piles while they are driven into the ocean floor, the improvement comprising:

lowering a housing, having a hammer mounted therein, and which has substantially the same diameter as the diameter of the pile to be driven, through said annular guide sleeves into contact with the pile; and



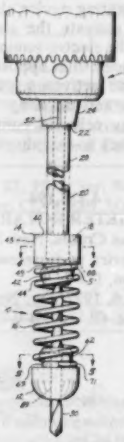
delivering a succession of blows to said pile with said hammer to drive said pile into the ocean floor.

4,138,200

DRILL STOP

Carl L. Nazarenus, Woodenville, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Feb. 1, 1978, Ser. No. 874,189
Int. Cl.[2] B23B *47/18*
U.S. Cl. 408—241 S 5 Claims



1. A drill stop capable of telescoping over a drill having the shank position thereof disposed between drill chuck jaws, said drill stop comprising:

a conically shaped nosepiece facing the drilling surface, said nosepiece having a hole coaxially disposed therein providing a slip fit with the drill diameter;

a cylindrically shaped bushing sleeve coaxially disposed about the drill, said cylindrically shaped bushing sleeve disposed along the axis of the drill between said conically shaped nosepiece and the drill chuck jaws;

a cylindrically shaped tubular member coaxially disposed about the drill, said cylindrically shaped tubular member disposed along the axis of the drill between said cylindrically shaped bushing sleeve and the drill chuck jaws;

said cylindrically shaped bushing sleeve having a first end for receiving a first end of said cylindrically shaped tubular member in press fit relationship therewith, said cylindrically shaped bushing sleeve having a cylindrically

shaped protuberance extending coaxially from the other end thereof opposite said first end;

said conically shaped nosepiece having a cylindrically shaped protuberance extending coaxially from the end thereof opposite the end facing said drilling surface; and,

a helical spring disposed along the axis of the drill between said conically shaped nosepiece and said cylindrically shaped bushing sleeve, said helical spring having a first end seated in a groove in said cylindrically shaped protuberance of said conically shaped nosepiece and a second end seated in a further groove in said cylindrically shaped protuberance of said cylindrically shaped bushing sleeve.

4,138,201

PUMP FOR USE IN NUCLEAR REACTOR PLANTS AND ANCHORING MEANS THEREFOR

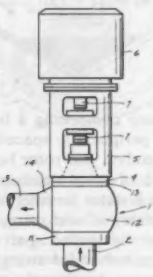
Robert Dernedde, Frankenthal, and Wolfgang Schneider, Hesheim, both of Fed. Rep. of Germany, assignors to KSB Kernkraftwerkspumpen GmbH, Frankenthal, Fed. Rep. of Germany

Filed Jan. 30, 1974, Ser. No. 438,034

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1973, 2305123

Int. Cl.[2] F01D *25/24;* G21C *9/00*

U.S. Cl. 415—219 C **15 Claims**



1. In a fluid displacing apparatus, particularly in a primary recirculating system for nuclear reactor plants, a combination comprising a centrifugal pump having a housing including a hollow main section and an annular portion integral with said main section; a pipe rigid with said annular portion; a support; and anchoring means including cooperating first and second parts respectively provided on said annular portion and said support for securing said annular portion to said support with limited freedom of movement in at least one direction.

4,138,202

HYDRAULIC MOTOR SYSTEM FOR DRIVING A SUBMERSIBLE IMPELLER PUMP IN WHICH REVERSAL OF HYDRAULIC FLOW IS PREVENTED

J. Marlin Eller, 204 NE. 8th Terr., Deerfield Beach, Fla. 33441

Continuation-in-part of Ser. No. 747,196, Dec. 3, 1976, abandoned. This application Jan. 14, 1977, Ser. No. 759,541

Int. Cl.[2] F04B *9/10, 49/10, 17/00*

U.S. Cl. 417—47 **2 Claims**

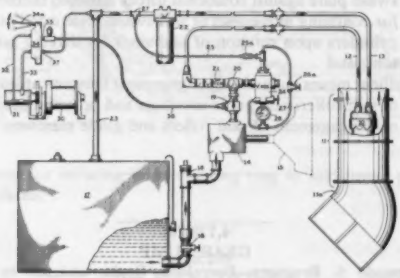
1. In combination with

a submersible pumping unit having a rotary pump including an impeller for pumping water up from the ground, a hydraulic motor in driving relationship with said pump for rotating said pump in one direction to pump the water up, and hydraulic lines connected to opposite sides of said hydraulic motor;

and an above-ground hydraulic system for operating said hydraulic motor in the submersible pumping unit, said hydraulic system including an oil tank, an above-ground pump operatively connected to pump oil from said tank to one of said hydraulic lines of the submersible pumping unit to drive the hydraulic motor for rotating said first-mentioned pump in said one direction, and return conduit means connected between the other of said hydraulic lines for the hydraulic motor in the submersible pumping unit and said oil tank to return the oil from said hydraulic motor to said tank;

the improvement which comprises:

anti oil flow reversing check valve means operatively connected in circuit with said lines and said hydraulic motor in the submersible pumping unit acting as a hydraulic brake for preventing said motor from being operated in reverse by the downward flow of water through said first-mentioned pump acting on said impeller when said above-ground pump is shut off;



a bypass pressure regulating valve connected in series with means including oil viewing means between the outlet side of said above-ground pump and said return conduit means for said oil tank to limit the pressure of the oil which operates said hydraulic motor in the submersible pumping unit by bypass oil flow, said oil viewing means enabling viewing of bypass oil flow through said regulating valve for adjustment purposes;

a bypass line connected in parallel around said pressure regulating valve;

a manual valve in said bypass line to be opened when starting said above-ground pump to relieve hydraulic pressure and then closed for operation;

and a pressure gauge in said bypass line for indicating hydraulic pressure.

4,138,203

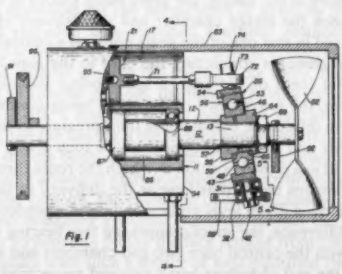
SWASH PLATE COMPRESSOR

Don S. Slack, 48 Overlook Dr., Bolinas, Calif. 94924

Filed May 19, 1977, Ser. No. 798,370

Int. Cl.[2] F04B *1/12, 27/08*

U.S. Cl. 417—269 **7 Claims**



1. A device comprising:

a housing and a shaft journalled for rotation therein and having an end extending therefrom, said housing having a plurality of cylinders spaced radially from and extending

parallel to said shaft and being circumferentially spaced about said shaft;

pistons mounted for reciprocation in said cylinders;

a swash plate journalled for rotation on said shaft end and connected to said pistons;

a pair of spaced apart parallel guide members supported by said housing in parallel relation to said shaft and adjacent said swash plate;

a pair of rollers rotatably supported on said swash plate, each on an axis extending radially thereto, one of said rollers being mounted to engage one of said guide members and the other of said rollers being mounted to engage the other of said guide members so as to support said swash plate against rotational forces imposed thereon and for confining movement of said swash plate axially of said cylinders upon rotation of said shaft for driving said pistons; and

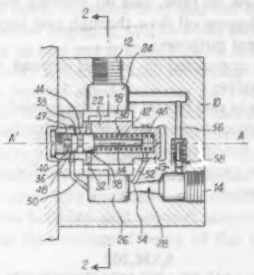
resilient means maintaining engagement between at least one of said rollers and guide members and providing continuous engagement of said rollers and guide members.

4,138,204

GEAR PUMP

Raimundo S. Bruguera, Barcelona, Spain, assignor to Bendiberica S.A., Spain

Filed Feb. 7, 1977, Ser. No. 766,315
Claims priority, application Spain, Feb. 10, 1976, 445.021
Int. Cl.[2] F04B *49/10*
U.S. Cl. 417—300 **1 Claim**



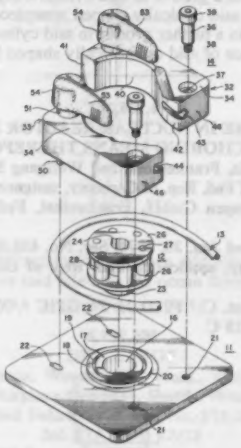
1. A gear pump comprising a casing provided with an inlet port communicating with an intake chamber and a delivery port communicating with a delivery chamber, a drive gear meshing with a driven gear, each gear being placed in a corresponding bore in the casing, the gears being placed in the flow path between the intake chamber and the delivery chamber, characterized in that one of the gears contains a central bore to which lead passages connecting the bore to the gaps between the adjacent teeth of the gear, a spool being slidable in the central bore, the movements of the spool being controlled by the pressure difference between the fluid pressure in the delivery chamber and an operating pressure in such a way that the spool is held in a closed position in which the route through the passages remains blocked as long as the delivery of the pump remains below a given level corresponding to a predetermined pressure difference, the spool comprising two bearing surfaces defining with the central bore two end chambers and a central chamber, the end chambers being exposed respectively to the fluid pressure in the delivery chamber and to the operating pressure, the route through the passages being blocked by one bearing surface of the spool when the latter is in its closed position, and the said route being open when the central chamber is opposite the passages due to movement of the spool.

4,138,205

MOVABLE STATOR WALLS PERMITTING ACCESS TO TUBING IN PERISTALTIC PUMP

Mark Wallach, New York, N.Y., assignor to Hydro Pulse Corporation, New York, N.Y.

Filed Dec. 15, 1975, Ser. No. 641,103
Int. Cl.[2] F04B *43/08, 43/12, 45/06*
U.S. Cl. 417—360 **7 Claims**



1. A peristaltic pump comprising a base member, a rotor having a plurality of peripherally spaced thrust elements disposed on said base member, said rotor being rotatable about a longitudinal axis, a pair of stator members disposed in opposite sides of said rotor, each stator member having a concave face confronting the periphery of said rotor, said stator members being pivoted, at laterally spaced apart proximate first ends thereof, to said base member for swinging about respective longitudinal axes between relative closed positions with said stator faces proximate said rotor and an open position with said stator faces remote from said rotor wherein when said stator members are in their closed positions the said first ends thereof are laterally spaced and the respective opposite second ends thereof are in substantially abutting engagement, means for releaseably locking said stator members in their closed positions, and a resilient collapsible tube disposed between said rotor and said stator member faces and compressed by successive thrust elements against said stator member faces when said stator members are in closed position and removable from between said rotor and stator members when said stator members are in open position.

4,138,206

GEAR-TYPE POSITIVE-DISPLACEMENT MACHINE

Vladimir D. Zinevich, ulitsa Schorsa, 4, kv. 11; Georgy Z. Yarmolenko, ulitsa 50 let USSR, 16a, kv. 44; Vladimir S. Sinyavsky, ulitsa Shevchenko, 93/1, kv. 7, all of Chernigov; Nikolai T. Romanenko, Tokmakov pereulok, 13-15, kv. 165, and Jury F. Nikitin, Arbat, 18/1, kv. 31, both of Moscow, all of U.S.S.R.

Continuation of Ser. No. 471,056, May 17, 1974, abandoned.
This application Aug. 9, 1976, Ser. No. 713,218
Int. Cl.[2] F01C *1/14, 5/02, 9/00*
U.S. Cl. 418—153 **13 Claims**

1. A gear-type positive-displacement machine, comprising:

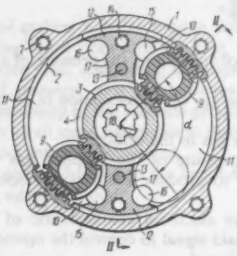
a housing having a row of inwardly directed teeth, a central gear in said housing, set coaxially to said housing, said central gear including a row of external outwardly directed teeth thereon;

two substantially cylindrically-shaped idle gears symmetrically spaced apart between said row of inwardly directed

teeth of said housing and said row of outwardly directed teeth of said central gear, said idle gears including rows of gear teeth meshing and interengaging with the respective rows of teeth of said inwardly directed teeth of said housing and of said outwardly directed teeth of said central gear, said idle gears being mounted with freedom to roll over said outwardly directed teeth of said external teeth of the central gear and said teeth of said housing to impart relative rotation between said housing and said central gear;

said interengaging rows of teeth of the idle gears, the housing and the central gear, having respective spaces defined therebetween in said housing;

webs within said housing between said housing and said central gear and fixed with respect to either said housing or said central gear and permitting relative movement therebetween, said webs being spaced apart about said central gear and positioned in said spaces so as to define two fluid-tight chambers, said webs including peripheral portions facing said housing adapted for sealing engagement with said housing to make said chambers fluid-tight, said webs including lateral surfaces facing said idle gears;



said idle gears being made of an elastic material having a diameter slightly larger than the clearance between said housing and said central gear that upon assembly said idle gears are lightly compressed into a flattened shape to provide for greater engagement between the teeth of said idle gears and said housing and said external teeth of said central gear to increase fluid-tightness between opposite sides of said idle gears; and,

fluid supply means forming part of said webs to define a passageway to supply working fluid to said fluid-tight chambers and to discharge the working fluid therefrom, said fluid supply means supplying the fluid through said lateral surfaces to the space between said lateral surfaces and said idle gears and to discharge fluid from the space between said lateral surfaces and said idle gears to impart rotation to said idle gears, said fluid supply means supplying fluid through and discharging fluid from said lateral surfaces to increase the volumetric efficiency of the gear-type machine.

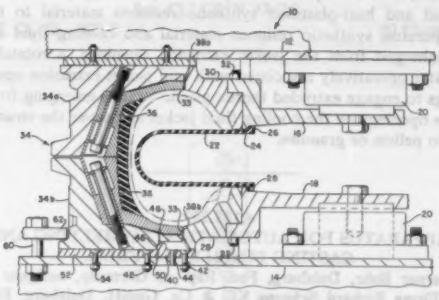
4,138,207

TIRE RETREAD MATRIX REGISTER ASSEMBLY

Charles L. Moses, Barberton, Ohio, assignor to Intercole Automation, Inc., Wadsworth, Ohio

Filed Dec. 14, 1977, Ser. No. 860,593
Int. Cl.[2] B29H *5/04*
U.S. Cl. 425—19 **5 Claims**

1. A matrix register assembly for tire retread apparatus in a combination including upper and lower matrix halves, a press having upper and lower press platens and upper and lower bladder hub plates, one of said press platens being movable on a vertical axis and where said assembly comprises a sidewall and bead plate ring for engaging the lower bladder hub plate and extending radially outwardly thereof, said lower matrix half is adapted to engage the radially outer end of said ring to be centered thereby, said matrix having an annular centering member on its lower surface, and a matrix register and centering ring having an upstanding annular centering member thereon, said centering members having complementary surfaces thereon for engaging each other to center said second named ring in said press, and



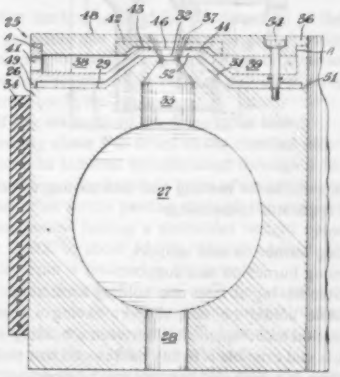
means for securing said centering ring to said lower press platen.

4,138,208

DIE FACE CUTTER

Earl T. Heckeroth, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 7, 1977, Ser. No. 766,302
Int. Cl.[2] B29F *3/08*
U.S. Cl. 425—71 **3 Claims**



1. An apparatus for the preparation of granules from a plurality of extruded heat-plastified synthetic resinous thermoplastic strands, the apparatus comprising in cooperative combination an annular die, the die having a die body, the die body defining an annular plenum, the plenum having means to communicate with a source of heat-plastified synthetic resinous material, the die having a die face of generally circular configuration, the die body adjacent the die face defining a plurality of circularly arranged extrusion openings communicating with the annular plenum, the extrusion openings capable of extruding a heat-plastified synthetic resinous strand, the extrusion openings terminating on the die face remote from the means to communicate with such a source of heat-plastified thermoplastic resinous material, a generally annular cooling fluid jacket disposed adjacent the die face, the cooling fluid jacket comprising a plurality of segments individually affixed to the die body defining a plurality of jacket extrusion openings corresponding to the extrusion openings, the cooling fluid jacket being supported by the die body, the cooling fluid jacket defin-

ing a jacket cavity therein, the cavity having means to receive cooling fluid from space external to the cooling fluid jacket, each of the jacket extrusion openings in the cooling fluid jacket having in association therewith at least one passage in communication with the jacket cavity whereby on supply of cooling fluid and heat-plastified synthetic resinous material to the apparatus, synthetic resinous material and cooling fluid are discharged from the jacket extrusion openings, a rotatable cutter operatively associated with said jacket extrusion openings to engage extruded thermoplastic strands emerging from the openings on the cooling fluid jacket and sever the strands into pellets or granules.

4,138,209

APPARATUS FOR AUTOMATICALLY MELTING AND CASTING FUSIBLE MATERIAL

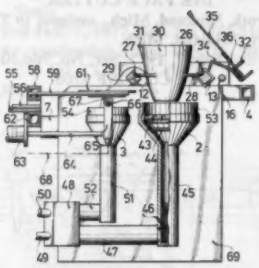
Werner Bahr, Duisburg, Fed. Rep. of Germany, assignor to Firma Richard Schoeps KG & Co. GmbH, Duisburg, Fed. Rep. of Germany

Filed Jan. 23, 1978, Ser. No. 871,485

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1977, 2702818

Int. Cl.² B22D *37/00, 41/06*

U.S. Cl. 425—160 **20 Claims**



1. An apparatus for melting and then casting a fusible material, said apparatus comprising:

a support;

a melting burner on said support;

a warming burner on said support;

a crucible having at least one holding formation;

a crucible holder on said support having a seat for said formation and displaceable between a holding position in which said crucible is firmly held in said seat and a freeing position in which said crucible can be separated from said seat of said crucible holder;

a mold holder on said support above said warming burner;

a mold engageable in said mold holder, whereby said warming burner can heat said mold;

tipping means on said support connected to said crucible holder for pivoting same between a melting position with said crucible upright above said melting burner and a pouring position with said crucible tipped and over said warming burner; and

control means connected to said crucible holder and said tipping means for maintaining said crucible holder in said holding position at least when said seat is in said pouring position, whereby on displacement of said crucible holder from said melting into said pouring position fused material in said crucible can be poured into said mold without tipping over of said crucible.

4,138,210

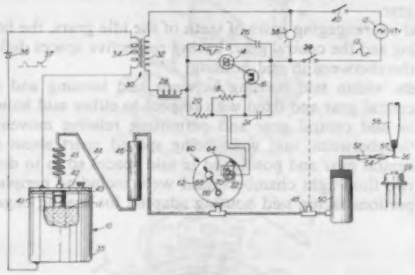
CONTROLLING THE PRESSURE OF A GAS GENERATOR

Michael K. Avedissian, Mohnton, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 27, 1977, Ser. No. 837,332

Int. Cl.² F23H *1/00*

U.S. Cl. 431—12 **9 Claims**



1. A method of controlling the pressure of a gas at an orifice comprising:

generating the gas by disassociation of an electrolytic solution;

supplying the gas to the orifice;

sensing the pressure of the supplied gas with a pressure transducer to produce a signal in response to pressure changes;

controlling an electrical characteristic of a circuit in response to said signal to control the operation of a switching element; and

varying the rate of gas disassociation of the electrolytic solution in response to the operation of the switching element, thereby controlling the pressure of the gas at the orifice.

4,138,211

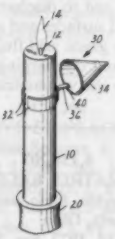
THERMOMECHANICAL CANDLE SNUFFER

Robert D. Kampfer, Lake Saint Croix Beach, and Gunther H. Dierssen, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 4, 1977, Ser. No. 848,489

Int. Cl.² F23Q *25/00*

U.S. Cl. 431—35 **7 Claims**



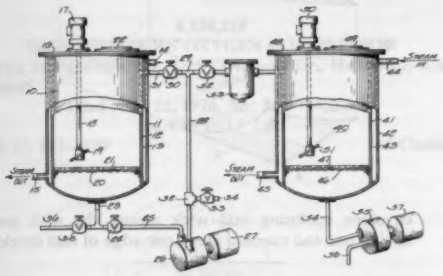
1. A thermomechanical candle snuffer comprising attaching means for attachment to a candle at a predetermined position, candle snuffing means for extinguishment of the flame of said candle and a staff, secured to said attaching means and engaging said candle snuffing means, composed of a material having a critical temperature for recovery from plastic deformation at a temperature of about 40° to 100° C.

4,138,212

PROCESS FOR PRODUCING WATER AND OIL SOLUBLE CURCUMIN COLORING AGENTS

Charles E. Stransky, 2442 S. 75th St., West Allis, Wis. 53219

Filed Aug. 10, 1977, Ser. No. 823,242
Int. Cl.[2] A23L *1/28*; C09B *62/00*; A23L *1/275*
U.S. Cl. 8—80 14 Claims



1. A method of making a water soluble liquid curcumin - containing coloring agent from turmeric root, which agent is suitable for coloring food, comprising the steps of:

mixing ground turmeric root and aqueous soap solution consisting essentially of the reaction product of a vegetable oil and an alkali metal hydroxide to dissolve the curcumin in the root into the liquid, and

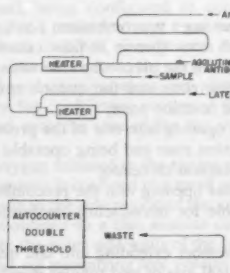
separating the root and liquid so the liquid may be used as the coloring agent in food.

4,138,213

AGGLUTINATION IMMUNOASSAY OF IMMUNE COMPLEX WITH RF OR Clq

Pierre L. Masson, Brussels, Belgium, and Joseph Heremans, deceased, late of Leuven, Belgium (by Marie-Térése Bracke Heremans, legal representative), assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 578,698, May 19, 1975, Pat. No. 4,062,935. This application May 20, 1977, Ser. No. 799,116
Claims priority, application United Kingdom, May 20, 1974, 22377/74
Int. Cl.[2] G01N *31/14, 33/16*
U.S. Cl. 23—230 B 12 Claims



1. A method of determining the presence in, or absence from, a biological fluid sample of an Ab:Ag complex, which comprises adding to the sample a solution of RF or Clq and a material which is caused to agglutinate on contact with RF or Clq, and detecting whether agglutination of the material occurs.

4,138,214

DIAGNOSTIC TEST UTILIZING HUMAN CHORIONIC GONADOTROPIN

Morris L. Givner, Pierrefonds, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,062
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B 20 Claims

1. In a test method suitable for the detection of the human chorionic gonadotropin of pregnancy or cancer in urine at a concentration as low as about 40 m.I.U./ml of urine and capable of detecting pregnancy as early as day 26 of a regular 28 day menstrual cycle including:

(a) clarifying a sample of the urine to be tested;

(b) subjecting about 5 to 50 ml of the clarified urine sample to absorbent induced ultrafiltration through a ultrafiltration membrane backed by a layer of absorbent capable of sorbing urine serum passing through the membrane, and said membrane having a molecular weight cut-off from about 15,000 to about 35,000, whereby human chorionic gonadotropin is retained in the sample;

(c) continuing the ultrafiltration until the retentate sample is one-tenth to one-five hundredth its original volume;

(d) diluting the retentate with sufficient water to provide a retentate sample of about 0.5 ml; and

(e) contacting the retentate sample with the appropriate amount of an immunologic reagent for detecting the presence of human chorionic gonadotropin in the retentate sample;

the improvement which comprises contacting said membrane with a dilute solution of polyvinylpyrrolidone prior to or concurrent with ultrafiltration, wherein said polyvinylpyrrolidone has an average molecular weight greater than about 9,000 and less than about 40,000; and wherein said immunologic reagent comprises:

(1) pyruvic aldehyde stabilized erythrocytes sensitized to human chorionic gonadotropin with a bifunctional molecule selected from glutaraldehyde, glyoxal, succinialdehyde, hexamethylene diisocyanate, toluene 2,4-diisocyanate, diethylmalonimidate dihydrochloride, dimethyl suberimidate, bis diazotized benzidine, cyanuric chloride, tetrazotized o-anisidine, and 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide; and

(2) a highly purified antiserum to human chorionic gonadotropin or the beta subunit thereof.

4,138,215

METHOD AND APPARATUS FOR GENERATING AND TRANSFERRING A GASEOUS TEST SAMPLE

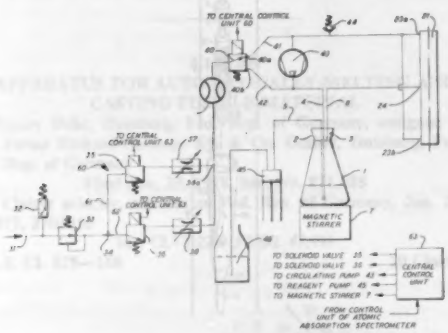
Bernhard W. Huber, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Continuation of Ser. No. 808,004, Jun. 20, 1977, abandoned. This application Sep. 21, 1977, Ser. No. 835,070

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627255

Int. Cl.[2] G01N *27/66*

U.S. Cl. 422—58 **17 Claims**


TO CENTRAL CONTROL UNIT 60
TO CENTRAL CONTROL UNIT 63
MAGNETIC STIRRER
TO SOLENOID VALVE 25
TO SOLENOID VALVE 35
TO CIRCULATING PUMP 45
TO REAGENT PUMP 45
TO MAGNETIC STIRRER 7
CENTRAL CONTROL UNIT
FROM CONTROL UNIT OF ATOMIC ABSORPTION SPECTROMETER

1. A device for generating a gaseous test sample from a liquid sample and for transferring this test sample into a measuring cuvette of an atomic absorption spectrometer comprising:

a measuring cuvette,

a sample vessel,

a closure plug for closing said sample vessel,

inert gas inlet passage means and an inert gas outlet conduit passing through said plug,

inert gas inlet conduit means for connecting said inert gas inlet passage means to an inert gas source,

means for adding reagent to the sample vessel,

means for stirring said sample vessel,

said inert gas outlet conduit being arranged to form permanent fluid flow communication between the interior of said sample vessel and said measuring cuvette,

said inert gas inlet conduit means including means for providing a first rate of flow of inert gas and a second substantially lower rate of flow of inert gas, and a solenoid control valve assembly for changing-over between said first flow rate and said second flow rate, and

control means for automatically controlling said solenoid valve assembly, said means for adding reagent, said means for stirring said sample vessel, in predetermined timed sequence with respect to each other.

4,138,216

DEVICE FOR MONITORING ETHYLENE OXIDE STERILIZATION PROCESS

Raymond P. Larsson, Denville, and Robert J. Witonsky, Princeton, both of N.J., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

Filed Dec. 23, 1977, Ser. No. 864,043

Int. Cl.[2] G01N *31/22*

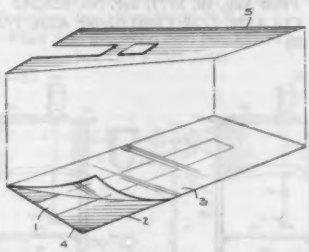
U.S. Cl. 422—56 **10 Claims**

1. A device for monitoring an ethylene oxide sterilization process which comprises:

(a) a wick means said wick means being impregnated with an ethylene oxide responsive chemical compound, a pH sensitive dye and a quantifier;

(b) a backing strip upon which the wick means is mounted; and

(c) a cover strip comprising an ethylene oxide impervious film adhered to said backing strip thereby forming an



envelope enclosing said wick means, the wick means having one end exposed along one edge of said envelope.

4,138,217

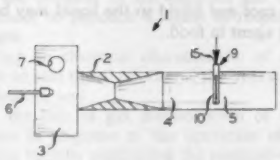
CARBON BLACK REACTOR

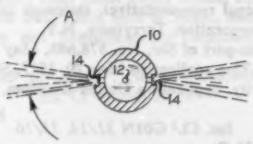
John E. Siagel, and Allen C. Howard, both of Orange, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 1, 1977, Ser. No. 764,665

Int. Cl.[2] C01B *49/00*; C09C *1/48*

U.S. Cl. 422—151 **16 Claims**





1. A carbon black producing apparatus, said apparatus including:

(a) a housing having a precombustion zone, a reaction zone and a quench zone therein in flow communication with one another with the precombustion zone being upstream of the reaction zone and the quench zone being downstream of the reaction zone;

(b) first means opening into one of the precombustion zone and the reaction zone and being operable for introducing make hydrocarbon thereinto;

(c) second means opening into the precombustion zone and being operable for introducing combustion gases thereinto;

(d) a tubular member extending into said quench zone with the longitudinal axis of said tubular member being generally normal to the longitudinal axis of the quench zone, said tubular member having a plurality of discharge openings along the length thereof, certain of the discharge openings being positioned on one side of the tubular member and certain other discharge openings being positioned on an opposite side of the tubular member whereby each discharge opening is directed for discharge at an angle in the range of about 30° upstream to about 30° downstream

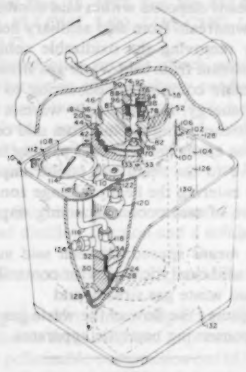
of said tubular member, said tubular member having a plurality of grooves recessed in the exterior of said tubular member and extending along the length of the tubular member and being positioned generally on opposite sides of the tubular member with each of said discharge openings opening into a respective groove.

4,138,218

HIGH PRESSURE OXYGEN COMPRESSOR

Clifton M. McClure, III, 7228 Governors Dr., Huntsville, Ala. 35805

Filed Nov. 22, 1976, Ser. No. 744,200
Int. Cl.[2] B01J 7/00
U.S. Cl. 422—120 6 Claims



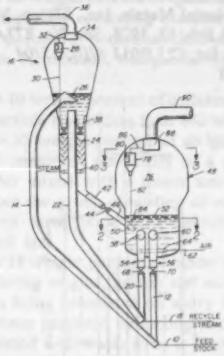
1. An oxygen compressor comprising:
a chemical oxygen generating canister, said canister having a cylindrical body with a generally flat top and flat bottom;
a cylindrical-shaped pressure vessel generally configured to surround said canister and including:
a round cylindrical-shaped body portion dimensioned to effect a side wall clearance between said canister and said vessel of 0.01 to 0.1 inch,
a lid, and means for sealably securing said lid to said vessel,
centrally positioned means supported by the inside of said lid for initiating oxygen release through a central region of the top of said canister, and
an annular portion of the inside of said lid, extending between said central region and the inside periphery of said vessel, being configured to conform to the top surface of said canister except there being shallow, 0.01 to 0.25 inch in depth, passageways between said centrally positioned means to the periphery, the area of said grooved passageways, measured along a plane of the otherwise flat conforming portion of the lid, being small compared with the area of the flat ungrooved area of said lid,
whereby oxygen released in the center portion of the top of said canister is confined to a small passageway region as it travels to the side region of the vessel, and thereafter it is confined to a thin annular cavity sufficient to pressurize the outer side walls of the canister within the vessel and yet minimizing free volume existing between said canister and said vessel;
an outlet conduit extending through the side wall of said vessel, and said conduit having outer end means for coupling said conduit to a tank to be charged;
pressure responsive relief means connected between the inside and ouside of said vessel for releasing inside pressure above a selected value;
a pressure indicating gauge connected to said conduit; and
a second conduit extending through said vessel including outer end means for adjustably opening and closing said conduit, whereby pressure may be released from said vessel.

4,138,219

APPARATUS FOR THE REGENERATION OF SOLID CATALYST

James H. Colvert, Houston; John P. MacLean, Stafford; Dale Williams, and Henry B. Jones, both of Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 813,139
Int. Cl.[2] B01J 8/28
U.S. Cl. 422—144 3 Claims



1. In a Fluidized Catalytic Cracking Unit regenerator for burning coke from spent cracking catalyst with oxygen containing gas to produce a flue gas and regenerated cracking catalyst, which comprises a vertical, cylindrical regeneration vessel adapted to contain a bed of fluidized cracking catalyst in the lower portion thereof and a dilute phase of catalyst and flue gas in the upper portion thereof, a dense phase solid inlet conduit tangentially entering the lower portion of said regeneration vessel and forming a spent catalyst inlet, means for introducing oxygen containing regeneration gas into the bottom of said regeneration vessel, cyclone separator means for separating catalyst from flue gas in said dilute phase, cyclone separator dipleg means for returning separated catalyst to said fluidized dense phase catalyst bed, means for withdrawing flue gas from said regeneration vessel, and means for withdrawing regenerated catalyst from said regenerator vessel, the improvement comprising:
a. said means for withdrawing regenerated catalyst comprising a substantially vertical drawoff conduit having outwardly flared walls defined by the frustrum of a right circular cone, having an eliptical open upper end defined by a rim having a high side and a low side in communication with said fluidized catalyst bed, wherein a plane defined by said open end rim is at an angle to horizontal such that the center of said eliptical open end is from about 6 inches to about 10 inches from the lower edge of said rim, and wherein said drawoff conduit is situated within said regenerator vessel circumferentially remote from said spent catalyst inlet such that the higher side of said open end rim is closest to said spent catalyst inlet;
b. said cyclone separator means having inlet means arrayed to face a path defined by circulating catalyst entering said regeneration vessel through said spent catalyst inlet and continuing about the periphery of said regeneration vessel, for receiving catalyst and flue gas from said dilute phase without a reversal of flow direction;
c. said dipleg means including dipleg discharge means arrayed for directing catalyst discharging from said dipleg means into said catalyst fluidized bed in the direction of a path defined by circulating catalyst entering said regener-

ation vessel through said spent catalyst inlet and continuing about the periphery of said regeneration vessel; and

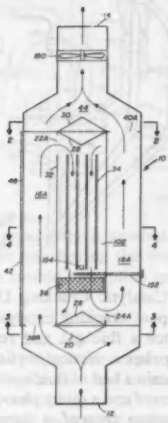
d. said means for introducing oxygen containing regeneration gas comprising a conduit having nozzles opening into the lower portion of said regeneration vessel wherein said nozzles are inclined in the direction of the path defined by circulating catalyst entering said regeneration vessel through said spent catalyst inlet and continuing about the periphery of said regeneration vessel.

4,138,220

APPARATUS FOR CATALYTIC OXIDATION OF GREASE AND FATS IN LOW TEMPERATURE FUMES

Ronald F. Davies, and John P. Manly, both of Elkton, Md., assignors to Colonial Metals, Inc., Elkton, Md.

Filed Feb. 13, 1978, Ser. No. 877,474
Int. Cl.[2] B01J *8/02, 35/04*
U.S. Cl. 422—173 **12 Claims**



1. Heat conserving catalytic apparatus for removing of oxidizable components in a waste gas stream, comprising,

a housing shell means having an inner wall as well as a gas stream inlet means formed in its upstream end and a gas stream outlet means formed in its downstream end, said housing shell means being formed in two sections along the longitudinal direction thereof;

an interior shell means having an outer wall and spaced from said inner wall of said housing shell means to form a heat exchange zone therebetween; said interior shell means being formed into two sections along the longitudinal direction thereof; said interior shell means being opened at both ends and having a longitudinally extending combustion chamber on the interior thereof to define a plenum area;

means for allowing facile opening of said two sections of said housing shell means and said two sections of said interior shell means along the longitudinal direction of said housing shell means and said interior shell means for access to the interior thereof;

a ducting structure within said heat exchange zone, said ducting structure means consisting of alternating input and output ducts, said input ducts receiving the unprocessed waste gas stream from said gas stream inlet means, and said outlet ducts receiving the processed waste gas stream from said combustion chamber;

a plurality of inlet ports formed as a part of the interior shell means and located at the upstream end of said combustion zone for communicating said plurality of inlet ducts designated for said unprocessed waste gas stream from said heat exchange zone with said combustion zone;

first and second baffle means being positioned at the upstream and downstream ends, respectively, of said interior shell means to define said plenum space for the combustion zone and to close off the ends of the respective output and input ducts in said heat exchange zone; said second baffle means forming a deflecting area therein for passage of said unprocessed waste gas stream from said heat exchange zone in the upstream end of said combustion zone in said interior shell means;

a plurality of outlet ports at the downstream end of said combustion zone in said interior shell means communicating said combustion zone with said plurality of outlet ducts designated for the outgoing processed waste gas stream;

an auxiliary heating means disposed within said combustion chamber to further heat said incoming unprocessed waste gas stream after passage through the heat exchange zone;

a catalytic means disposed within said combustion zone and spaced downstream from said auxiliary heating means for flamelessly removing the oxidizable components of the waste gas stream from said waste gas stream, oxidizing of said oxidizable components occurring to release at least some heat energy, the relatively warmer processed oxidized gas stream being ducted from said combustion zone into the heat exchange zone and passing into countercurrent relative to the relatively cooler unprocessed waste gas stream entering the heat exchange zone to elevate the temperature of said cooler incoming unprocessed waste gas stream;

thermostatic means spaced between said auxiliary heating means and said catalytic means for controlling the temperature of said waste gas stream; and

means for inducing the flow of the waste gas stream through said heat conserving catalytic apparatus.

4,138,221

MANUFACTURE OF PELLETS FROM COAL CONVERSION PRODUCTS

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Filed Dec. 15, 1977, Ser. No. 861,079
Int. Cl.[2] C10L *5/00, 5/16;* **C10G** *1/00*
U.S. Cl. 44—10 C **2 Claims**

1. The process of pelletizing a pumpable non-distillable product derived from a coal conversion process which comprises:

(a) splitting said product into first and second streams;

(b) subjecting said first stream to low temperature carbonization to yield particulate char and vaporous products;

(c) forming a pelletizable composition out of said second stream and said particulate char;

(d) pelletizing said pelletizable composition; and

(e) recovering pellets from step (d).

4,138,222

PELLETIZATION OF COAL CONVERSION PRODUCTS

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Filed Dec. 15, 1977, Ser. No. 861,081
Int. Cl.[2] C10L *5/00, 5/16;* **C10G** *1/00*
U.S. Cl. 44—10 C **3 Claims**

1. The process of pelletizing a pumpable non-distillable product derived from a coal conversion process which comprises:

a. circulating a stream of particulate coal derived solids to a pelletization zone in intimate contact with a slurry of said pumpable product in which there has been suspended finely divided coaly solids, under conditions such that said particulate coal-derived solids form agglomerates or pellets of larger size;

b. subjecting said pellets to solvent treatment to remove liquid coating from the surface of the pellets;

c. separating those pellets from step (b) which are smaller

than desired, and recycling them to said pelletization zone for reprocessing; and

d. recovering the pellets of desired size from step (b).

3. The process according to claim 2 wherein said coaly solids are char, the solids product obtained by the low temperature carbonization of coaly solids.

4,138,223

MANUFACTURE OF PELLETS FROM COAL LIQUEFACTION PRODUCTS

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Filed Dec. 15, 1977, Ser. No. 861,082

Int. Cl.[2] C10L *5/00, 5/16;* C10G *1/00*

U.S. Cl. 44—10 C 1 Claim

1. In a coal liquefaction process which employs a liquefaction solvent, wherein an effluent slurry product is recovered which contains a solution of coal liquefaction products in said liquefaction solvent, and finely divided, undissolved solids suspended in said solution, the improvement which comprises:

(a) splitting said effluent slurry product into first and second streams;

(b) subjecting the first stream to vacuum distillation to yield an overhead distillate fraction and a solids-laden bottoms fraction;

(c) mixing the second stream with particulate char, to form a slurry;

(d) subjecting the slurry from step (c) to low temperature carbonization to form char and vaporous products;

(e) forming a pelletizable composition out of the solids-laden bottoms fraction from step (b) and the char from step (d);

(f) pelletizing said pelletizable composition from step (e); and

(g) recovering pellets from step (f).

4,138,224

PRODUCTION OF FIXED BED GASIFIER FEEDSTOCK AND FUELS FROM COAL

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Filed Dec. 15, 1977, Ser. No. 861,080

Int. Cl.[2] C10L *5/16, 5/14;* C10G *1/00*

U.S. Cl. 44—23 1 Claim

1. In a coal liquefaction process which employs a liquefaction solvent wherein a product is recovered which contains a solution of coal liquefaction products in said liquefaction solvent, and finely divided undissolved solids suspended in said solution; and wherein a separation step is included for the separation of said suspended solids from said solution, which uses a precipitating solvent to effect agglomeration of said suspended solids, the improvement which comprises:

(a) mixing said product in an agglomeration zone in admixture with said precipitating solvent and an added amount of relatively coarse coal-derived carbonaceous solids, such that the amount of deposit precipitated by the precipitating solvent serves to bind together said suspended solids and said added amount of solids into agglomerates larger than said added solids;

(b) recovering a pumpable slurry of said enlarged agglomerates from said agglomeration zone;

(c) converting said pumpable slurry in a pelletization zone to pellets larger than said agglomerates produced in said agglomeration zone by the further addition of coal-derived carbonaceous solids under pelletizing conditions; and

(d) recovering enlarged pellets from said pelletization zone.

4,138,225

MATCH WITH CELLULOSE NITRATE INSTEAD OF SULFUR

Shuzo Nagatugi, Kobe; Akira Miyagawa, and Suguru Fukuoka, both of Himeji, all of Japan, assignors to Daicel Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 654,346, Feb. 2, 1976, Pat. No. 4,040,879. This application Mar. 16, 1977, Ser. No. 778,155

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.[2] C06F *3/00*

U.S. Cl. 44—42 2 Claims

1. A match having a friction ignitable tip, said tip consisting essentially of a blend of

A. from 40 to 60 weight percent of igniting component, said igniting component consisting essentially of from 50 to 100 weight percent of potassium chlorate and the balance is potassium bichromate, manganese dioxide or mixture thereof,

B. from 0.1 to 10 weight percent of cellulose nitrate particles having a particle size of less than 840 microns,

C. from 20 to 35 weight percent of an ignition controlling component consisting essentially of a major amount of glass powder mixed with a minor amount of substance selected from the group consisting of mica powder, talc, diatomaceous earth, boric acid, colloidal clay and mixtures thereof, and

D. from 10 to 18 weight percent of binder selected from the group consisting of glue, gelatin and mixtures thereof, all percentages being calculated on a dry weight basis, said tip having been prepared by mixing said cellulose nitrate particles wetted with water so as to contain more than 20 weight percent of water, based on the combined weights of said cellulose nitrate particles and water, and being free of organic solvent, with the other ingredients of said tip, and then drying the tip.

4,138,226

PROCESS FOR PREPARING A SUSPENSION OF PARTICLES IN A HYDROCARBON OIL

Eke Verschuur, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1977, Ser. No. 782,879

Claims priority, application United Kingdom, Mar. 31, 1976, 13024/76

Int. Cl.[2] C10L *1/32*

U.S. Cl. 44—51 15 Claims

1. In a process for preparing a suspension of coal particles in a hydrocarbon fuel in which an aqueous suspension of ash-containing coal particles and a binder are agglomerated in an agglomeration zone to produce agglomerates of coal particles and binder, and an ash-containing water phase, the agglomerates are separated from the ash-containing water phase and suspended in a hydrocarbon fuel, the agglomerates being disintegrated and the resulting coal particles becoming suspended in the hydrocarbon fuel, the improvement comprising, separating at least a portion of the coarse particles suspended in the hydrocarbon fuel, grinding the coarse particles, and returning the ground particles to the agglomeration zone.

4,138,227

PRODUCTION OF LOW POUR, LOW SULFUR FUEL OILS

Raymond F. Wilson; Reese A. Peck, both of Fishkill; Sheldon Herbstman, Spring Valley, and Li C. Mih, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 736,625, Oct. 28, 1976, abandoned, which is a continuation of Ser. No. 537,032, Dec. 27, 1974, abandoned. This application Dec. 27, 1977, Ser. No. 865,104

Int. Cl.[2] C10L *1/18*

U.S. Cl. 44—62 6 Claims

1. A process for the production of a residual petroleum fuel

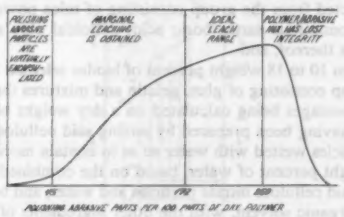
oil blend of improved pour point and reduced sulfur content which comprises subjecting a high sulfur, high pour point atmospheric residuum having a wax content between 0 and 5 weight percent to thermal cracking, separating the thermally cracked product by means of distillation under subatmospheric pressure into a vacuum gas oil having an end point of about 1000° F. and a vacuum residuum, subjecting the vacuum gas oil to catalytic hydrogenation under desulfurization conditions and forming a residual fuel blend containing said vacuum residuum, the hydrogenated vacuum gas oil and from 30 to 70 weight percent based on the weight of the blend of a high wax low sulfur atmospheric residuum having a wax content in excess of 10 weight percent, said blend also containing from 0.05 to 1.0 weight percent pour point depressant.

4,138,228

ABRASIVE OF A MICROPOROUS POLYMER MATRIX WITH INORGANIC PARTICLES THEREON

Jørgen Hartfelt, Hørsholm, Denmark, and Ralf Hoehn, Chelmsford, Mass. 01824, assignors to Ralf Hoehn, 36 Berkeley Dr., Chelmsford, Mass.

Filed Feb. 2, 1977, Ser. No. 764,777
Int. Cl.² B24B *1/00*; C08S *51/12*
U.S. Cl. 51—295 **9 Claims**


POLISHING ABRASIVE PARTICLES ARE VIRTUALLY UNCAPSULATED
MARGINAL LEACHING IS OBTAINED
IDEAL LEACH RANGE
POLYMER/ABRASIVE BOND HAS LOST INTEGRITY
LEACH LEVEL
POLISHING ABRASIVE PARTS PER 100 PARTS OF DRY POLYMER

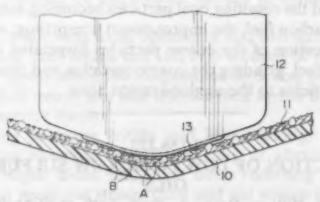
1. An improved article for preparing critical surfaces, consisting essentially of platelets of a polymer and an inorganic polishing abrasive of an average particle size less than 10 microns, the platelets forming a microporous sponge-like polymer matrix which is liquid absorbing, essentially all of the abrasive particles being entirely unencapsulated and being carried on the surfaces of the platelets.

4,138,229

CLEANING TAPE FOR MAGNETIC HEAD

Eiichi Tadokoro; Masahiro Utumi; Masaaki Fujiyama, all of Odawara, and Satoru Takayama, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 20, 1977, Ser. No. 844,027
Claims priority, application Japan, Dec. 21, 1976, 51-153657
Int. Cl.² B24D *3/00*; G11B *5/41*
U.S. Cl. 51—398 **10 Claims**



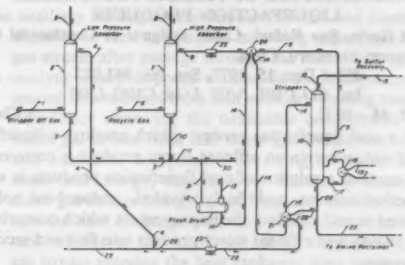
1. A cleaning tape for cleaning the surface of a magnetic recording head of a magnetic tape recorder or the like comprising a flexible substrate and a cleaning layer disposed thereon, said cleaning layer containing two kinds of particles one of which has a diameter of not more than 5μ and Mohs hardness of not less than 5.5, and the other of which has a diameter of 6 to 200μ and Mohs hardness of not more than 5.

4,138,230

DUAL PRESSURE ABSORPTION PROCESS

H. Lytle Thompson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 5, 1977, Ser. No. 813,046
Int. Cl.² B01D *53/14, 53/34*
U.S. Cl. 55—48 **9 Claims**



4. A process for removing H_2S from a first high pressure fluid stream and from a first low pressure fluid stream which comprises the steps of:

(a) countercurrently contacting the first high pressure fluid stream with a first lean absorbent stream in a first absorption zone maintained at absorption-promoting conditions including a pressure above 28 atmospheres, and thereby effecting the formation of a first rich absorbent stream and a second high pressure fluid stream which has a lower H_2S concentration than the first high pressure fluid stream;

(b) countercurrently contacting the first low pressure fluid stream with a second lean absorbent stream in a second absorption zone maintained at absorption-promoting conditions including a pressure below 14 atmospheres, and thereby effecting the formation of a second rich absorbent stream and a second low pressure fluid stream which has a lower H_2S concentration than the first low pressure fluid stream;

(c) passing the first rich absorbent stream and the second rich absorbent stream into a flash zone maintained at flashing conditions effective to cause the vaporization of hydrocarbons having fewer than three carbon atoms per molecule;

(d) withdrawing a third rich absorbent stream from the flash zone and passing the third rich absorbent stream into an upper point of an absorbent regeneration zone maintained at absorbent regeneration conditions which include the countercurrent contacting of liquid phase adsorbent with rising vapors;

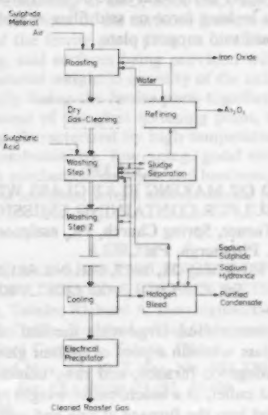
(e) withdrawing a liquid sidecut stream which has a lower H_2S concentration than the third rich absorbent stream from the absorbent regeneration zone, and passing at least a portion of the liquid sidecut stream into the first absorption zone as the sole absorbent stream in said first absorption zone; and,

(f) withdrawing a bottoms liquid stream which has a lower H_2S concentration than the liquid sidecut stream from the absorbent regeneration zone, and passing at least a portion of the bottoms liquid stream into the second absorption zone as the sole absorbent stream in said second absorption zone.

4,138,231
METHOD OF WET-CLEANING GASES CONTAINING SULFUR DIOXIDE, HALOGENS AND ARSENIC FROM PYROMETALLURGICAL TREATMENT OF SULPHIDIC MATERIALS

Bo G. V. Hedenäs, Viken; Johan E. Wiklund, Helsingborg; Thore R. H. Johansson, Helsingborg, and Karl-Axel Melkersson, Helsingborg, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Mar. 30, 1977, Ser. No. 782,908
Claims priority, application Sweden, Apr. 9, 1976, 7604219
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—71 11 Claims



1. A method of wet-cleaning gases containing sulfur dioxide, halogens, and at least one volatilized substance selected from the group consisting of arsenic and arsenic compounds emanating from pyrometallurgical treatment of sulfidic materials, comprising washing the gases with diluted sulfuric acid circulating in a closed circuit, substantially the whole amount of the volatilized substance or substances present being taken up and solidified in said diluted acid;

selectively separating said solidified substance or substances from a part-stream of said diluted sulfuric acid in said closed circuit;

recycling the part-stream to the washing step and the pyrometallurgical treatment;

removing from the washed gases any entrained liquid sulfuric acid;

controlling the water content of the gases so as to permit a substantial water condensation to be obtained during the subsequent cooling, cooling the washed gases having controlled water content whereby halogen ions are substantially completely taken up in the formed condensate;

separating the condensate from the gases;

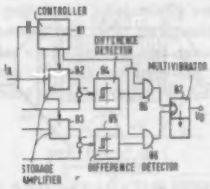
treating at least a part of the condensate with a precipitating agent so as to precipitate any residual amounts of arsenic compounds;

separating the precipitate from the remaining condensate and neutralizing and discharging said remaining condensate to a recipient.

4,138,232
DETECTOR FOR DETECTING VOLTAGE BREAKDOWNS ON THE HIGH-VOLTAGE SIDE OF AN ELECTRIC PRECIPITATOR

Heinrich Winkler, Nuremberg; Gerhard Rumold, Bubenreuth, and Helmut Schummer, Heusenstamm, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 2, 1976, Ser. No. 720,095
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1975, 2540084
Int. Cl.[2] B03C *3/66*
U.S. Cl. 55—105 1 Claim



1. In a detector for detecting voltage breakdowns on the high-voltage side of an electric precipitator coupled to the detector, the voltage of the precipitator being supplied from an a-c network through a thyristor control circuit coupled to said a-c network, a high-voltage transformer coupled in series relationship to said thyristor control circuit, and a rectifier coupled in series relationship to said high-voltage transformer, said precipitator being coupled in series relationship to said rectifier, and said detector continuously comparing characteristic parameters of successive half-waves of periodical variations of the voltage at the precipitator, a predetermined deviation between successive characteristic parameters being a criterion for determining a breakdown of the precipitator voltage, the improvement comprising

first means, coupled to said precipitator, for determining at fixed points in time individual values of the precipitator voltage on the decreasing flanks of the precipitator voltage half-waves,

second means, coupled to said first means, for storing the precipitator voltage values determined, and

third means, coupled to said second means, for comparing the precipitator voltage values determined with respective individual precipitator voltage values determined for a successive half-wave at corresponding later points in time,

said second means comprising at least one storage amplifier, and said third means including at least one difference detector, coupled to said storage amplifier, to which said precipitator voltage values are transmitted and control means coupled to the precipitator and said storage amplifier, synchronized with the harmonics of said precipitator voltage, for controlling said storage amplifier and said difference detector.

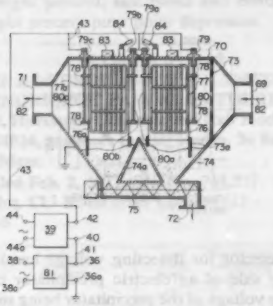
4,138,233
PULSE-CHARGING TYPE ELECTRIC DUST COLLECTING APPARATUS

Senichi Masuda, 40-10-605 Nishigahara 1-chome, Kita-ku, Tokyo-to, Japan

Filed Jun. 16, 1977, Ser. No. 807,240
Claims priority, application Japan, Jun. 21, 1976, 51-073004
Int. Cl.[2] B03C *3/41, 3/66*
U.S. Cl. 55—139 11 Claims

1. A pulse-charging electric dust collecting apparatus comprising: a main body housing defining a duct for gas flow therethrough, said housing including a gas inlet for introducing a dust-containing gas, a gas outlet for discharging a cleaned gas from said housing, and a dust exhaust port for exhausting collected dust from said housing to the exterior; at least one

dust collecting electrode disposed within said housing for collecting dust; at least one high corona-starting-voltage discharge electrode means disposed in opposed relation to said at least one dust collecting electrode and insulated therefrom; an adjustable D.C. high voltage power source means for applying a D.C. high voltage having an adjustable magnitude between said at least one dust collecting electrode and said at least one high corona-starting-voltage discharge electrode means to establish an intense principal electric field having an adjustable magnitude in the space between said at least one dust collecting electrode and said at least one discharge electrode means and



an adjustable varying voltage power source means connected in series to said adjustable D.C. high voltage power source means for applying an adjustable varying voltage, which varies periodically with time and has an adjustable magnitude, waveform width and repetition period, between said at least one dust collecting electrode and said at least one discharge electrode means and in superposition on said adjustable D.C. high voltage to effect corona discharge from said at least one high corona-starting-voltage discharge electrode means towards said at least one dust collecting electrode only upon application of said adjustable varying voltage whereby ion current is periodically generated for charging dust particles.

4,138,234

HOLDER FOR ANNULAR FILTER

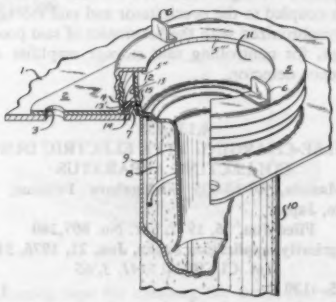
Frantisek Kubesa, Hasselroth, Neuenhasslau, Fed. Rep. of Germany, assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 11, 1977, Ser. No. 823,795

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 7708188[U]

Int. Cl.[2] B01D *46/02*

U.S. Cl. 55—374 **4 Claims**



1. A holder attached to a horizontal support plate, said holder comprising a support basket having at its upper end a venturi tube portion with an upwardly and outwardly extending flared collar portion, a sealing ring having a tapered wall surface which cooperates with said flared collar portion to lock the open end wall portion of an open ended annular bag type filter within which said support basket is suspended between said tapered wall surface and said collar portion when a downward force is applied to the upper peripheral edge of said collar portion, said support plate containing a circular aperture of sufficient diameter to accommodate those portions of said support basket which are located below said collar portion, the horizontal rim surface of said support plate surrounding and defining said circular aperture serving as a support for an outer peripheral portion of said sealing ring, a sealing gasket positioned between said rim surface and said outer peripheral portion of said sealing ring, a threaded base ring fixed to and extending upwardly from said support plate about the aperture, a complementary threaded locking ring in threaded engagement with said base ring, said locking ring having an aperture in its center aligned with said venturi tube portion and a horizontal portion surrounding said center aperture which engages the upper peripheral edge of said flared collar portion and applies a locking force on said filter as said locking ring is rotated toward said support plate.

4,138,235

METHOD OF MAKING FLAT GLASS WITH LOWER SULFUR-CONTAINING EMISSIONS

Warren H. Turner, Spring Church, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 31, 1977, Ser. No. 801,672

Int. Cl.[2] C03B *3/00*; C03C *3/00*

U.S. Cl. 65—27 **12 Claims**

1. In the continuous, large-scale method of melting soda-lime-silica glass wherein a pool of molten glass is maintained within an elongated furnace, and raw, unmelted glass batch materials and cullet, in a batch/cullet weight ratio of 70/30 to 100/0, are fed into the furnace at one end and melted glass is withdrawn at the opposite end and formed into a flat glass ribbon, wherein sources of Si, Na, K, Ca, Mg, Al, and Fe in the batch and cullet are proportioned to yield a final glass composition comprising, by weight:

69–75 percent SiO_2
12–16 percent Na_2O
0–2 percent K_2O
8–12 percent CaO
2–5 percent MgO
0–2 percent Al_2O_3
0–0.7 percent Fe_2O_3

and the interior of the furnace is maintained at sufficient temperatures and conditions to melt and react the batch and cullet to yield said glass composition, wherein the batch and cullet also include sources of sulfur, a portion of which is retained in the glass and additionally comprises 0.15 percent to 0.5 percent by weight of final glass composition as SO_3 and the remainder of which is volatilized and escapes from the pool of molten glass as gaseous products of reaction, said volatilization and escape of part of the sulfur serving as essentially the sole fining agent to reduce gaseous inclusions in the glass, said sulfur sources being provided in an amount and conditions being maintained in the furnace to induce sufficient volatilization of sulfur to fine the glass to a seed count of no more than one seed per square foot of formed glass ribbon, the improvement comprising:

maintaining the input rate of sulfur from the batch and cullet being fed into the furnace at 1.20 to 2.25 times the weight of sulfur being withdrawn in the final glass composition, whereby sulfur-containing emissions from the furnace are minimized while maintaining sufficient fining action.

4,138,236
METHOD OF PERMANENTLY BONDING MAGNETIC CERAMICS

Florian Haberey, No. 264, Markstrasse, 4630 Bochum, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,222
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655480
Int. Cl.² C03C 27/00
U.S. Cl. 65—43 7 Claims

1. A method of bonding hard and/or soft magnetic ferrite parts together which comprises the steps of

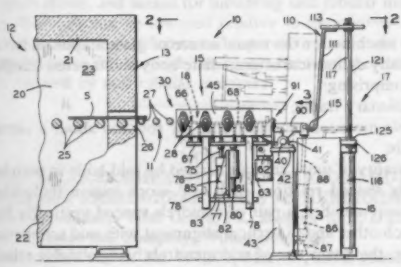
a. applying an oxide glass comprising iron oxide in an amount corresponding to about 50 to about 200% of the iron oxide proportion at the eutectic point of the respective glass-forming multi-component system, about 0.4 to about 0.8 mole of at least one wetting agent selected from the group consisting of SiO_2, P_2O_5 and B_2O_3 and about 0.1 to about 0.4 mole of at least one alkali oxide selected from the group consisting of BaO, SrO, CaO, K_2O, Na_2O and Li_2O to at least one of the surfaces that are to be bonded together of the ferrite parts prior to or after prefiring or main firing, said surfaces being provided with the frit or the raw material weight-in quantity of the oxide glass, and

b. subsequently fusing the ferrite parts together at temperatures in excess of the glass softening point, the resulting bond being characterized by high temperature resistance and non-combustibility, low aging, good chemical resistance, high mechanical strength and hardness, avoiding of troublesome marginal layers, and economic producibility.

4,138,237
METHOD OF AND APPARATUS FOR SHAPING AND HEAT TREATING GLASS SHEETS

John N. Eggert, Toledo; Richard A. Herrington, Walbridge, and Waldemar W. Oelke, Rossford, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Nov. 23, 1977, Ser. No. 854,120
Int. Cl.² C03B 23/02, 27/00
U.S. Cl. 65—104 9 Claims



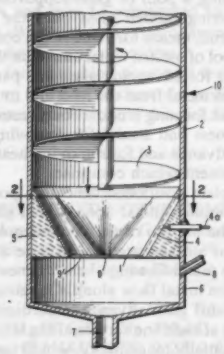
1. A method for heat treating a glass sheet comprising: supporting and conveying a glass sheet in a substantially horizontal plane for movement along a horizontal path, heating said sheet during said movement through a heated atmosphere and while so supported, advancing said sheet in said path onto a pivotal frame in bending relation to a shaping surface on said frame disposed below said path, locating the leading edge of said sheet against stop means provided on said frame, lifting said shaping surface to engage and raise said sheet above said path to effect shaping thereof, swinging said frame from a substantially horizontal plane into a substantially vertical plane to pivot said sheet about said leading edge in an arcuate path past a true vertical and into an inclined attitude against an adjacently positioned glass receiving means, and lowering said receiving means into a cooling medium for chilling said glass sheet.

4. Apparatus for heat treating glass sheets comprising: a conveyor for supporting and conveying a glass sheet in a substantially horizontal plane for movement along a horizontal path through a furnace, a pivotal frame exteriorly of said furnace, a bending member mounted on said pivotal frame and having an upwardly facing shaping surface formed thereon, retractable stop means on said frame engageable by the leading edge of said sheet, a plurality of conveyor rolls mounted on said frame and forming a continuation of said conveyor for supporting a glass sheet above said shaping surface, means on said pivotal frame for driving said series of conveyor rolls to advance said sheet against said stop means, means for moving said shaping surface upwardly to engage and lift said sheet above said conveyor rolls to effect shaping of said sheet, glass receiving means spaced rearwardly of said pivotal frame, means for swinging said pivotal frame upwardly relative to said horizontal path into a substantially vertical plane to effect pivotal movement of said sheet about said leading edge in an arcuate path past a true vertical and onto said glass receiving means, and means lowering said receiving means into a quench tank for immersing the glass sheet carried thereby into a bath of coolant.

4,138,238
METHOD AND APPARATUS FOR PRODUCING MOLTEN GLASS

Edward T. Strickland, 1011 Anchorage La., Box 6529, San Diego, Calif. 92106

Filed Apr. 8, 1977, Ser. No. 785,845
Int. Cl.² C03B 5/02, 3/00
U.S. Cl. 65—134 13 Claims



1. The methd of melting glass-forming materials comprising:

(a) establishing a bed of particulate substantially gas-free glass-forming materials;

(b) urging said particulate materials with a force of at least about 1 lb. per square inch into close proximity with a resistance heating member, said heating member being at a temperature of at least about 2600° F. and having at least one outlet for molten glass;

(c) melting said glass-forming materials with heat transmitted from said resistance heating member to form a molten glass;

(d) flowing said molten glass through said outlet at a rate to maintain only a thin film of molten glass on said heating member; and

(e) collecting said molten glass in a heated reservoir having a gas space over the molten glass.

8. An apparatus for melting glass-forming materials comprising:

(a) container means for glass-forming materials in communication with a resistance heating member, said heating member having at least one outlet for molten glass;

(b) mechanical means for urging the particulate glass-forming materials toward said resistance heating member; and

(c) molten glass reservoir means adjacent to said resistance

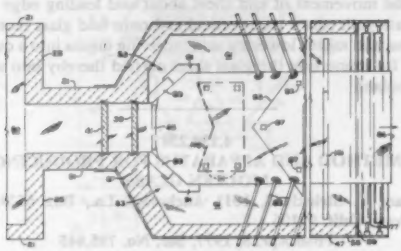
heating member and in communication with said outlet of resistance heating member, said reservoir having a gas outlet in the upper portion thereof and a molten glass outlet in the lower portion thereof.

4,138,239

SUBMERGED PLATE FOR SELECTIVE DIVERSION OF MOLTEN METAL FLOW IN A GLASS FORMING CHAMBER

Thomas J. Nier, Corpus Christi, Tex., and Charles K. Edge, Sarver, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 7, 1977, Ser. No. 840,199
Int. Cl.[2] C03C *18/02*
U.S. Cl. 65—182 R **13 Claims**



1. In a flat glass forming chamber including an enclosed chamber containing a pool of glass-supporting molten metal, means for delivering molten glass onto the pool of molten metal at an inlet end, means for removing a continuous sheet of glass from the pool of molten metal and from the chamber at an outlet end, means for advancing glass in a path along the surface of the molten metal from the inlet end to the outlet end of the chamber while forming it into a continuous sheet of desired width and thickness and means for removing heat from the glass during its advance and for removing heat from the chamber, the improvement which comprises

a submerged plate positioned beneath a portion of the surface of the molten metal upon which glass is supported and above the bottom of the pool of molten metal which has sufficient surface area to provide a drag resistance upon molten metal flowing over or beneath it to cause the rate of molten metal flow along a longitudinal path parallel to a path for glass advance to be diminished, and said plate having at least one surface along which molten metal flows substantially tangentially, which surface has leading edges which diverge outwardly in a downstream direction from a centrally disposed tip at an upstream end of the plate, the divergence of said edges being at an angle sufficient to deflect longitudinally flowing molten metal outwardly toward the chamber side walls.

8. In a flat glass forming chamber including an enclosed chamber containing a pool of glass-supporting molten metal, means for delivering molten glass onto the pool of molten metal at an inlet end, means for removing a continuous sheet of glass from the pool of molten metal and from the chamber at an outlet end, means for advancing glass in a path along the surface of the molten metal from the inlet end to the outlet end of the chamber while forming it into a continuous sheet of desired width and thickness and means for removing heat from the glass during its advance and for removing heat from the chamber, the improvement which comprises:

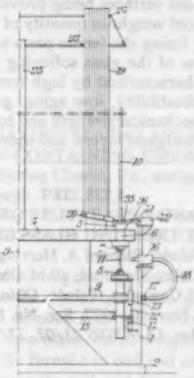
a submerged plate positioned beneath a portion of the surface of the molten metal upon which glass is supported and above the bottom of the pool of molten metal which has sufficient surface area to provide a drag resistance upon molten metal flowing over or beneath it to cause the rate of molten metal flow along a longitudinal path parallel to a path for glass advance to be diminished, and said plate having at least one surface along which molten metal flows substantially tangentially, which surface has interiorly disposed edges which converge inwardly in a downstream direction from a marginal portion to a centrally disposed interior recess, the convergence of said edges being at an angle sufficient to deflect longitudinally flowing molten metal inwardly toward the center of the chamber.

4,138,240

MACHINE FOR MANUFACTURING AMPULLAE, PARTICULARLY PHARMACEUTICAL AMPULLAE

Claude Dehais, Paris, France, assignor to Sotapharm, LaFerte-Bernard, France

Filed May 2, 1977, Ser. No. 792,789
Claims priority, application France, May 3, 1976, 76 13185
Int. Cl.[2] C03B *23/10*
U.S. Cl. 65—280 **6 Claims**



1. A machine for the manufacture of glass ampoules having a generally cylindrical intermediate body and tapered frangible ends comprising:

a stationary frame;

a table mounted on said frame for rotation about a vertical axis;

a plurality of work stations carried by said table in peripherally spaced relation, each said work station including a scoop member, a pair of mandrels spaced vertically from each other and in vertical alignment with said scoop member, the lower one of said mandrels being slidable relative to the upper one of said mandrels, means for effecting the vertical displacement of said lower mandrel relative to said upper mandrel according to a predetermined cyclical pattern, and means for opening and closing said mandrels at predetermined times;

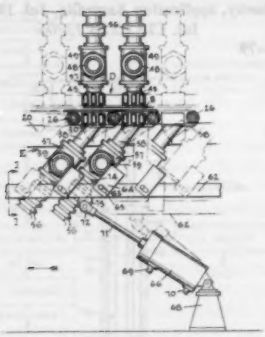
a plurality of heat emitting stations mounted on said frame in uniformly spaced relation about said table at a level between said upper and lower mandrels;

means for storing a plurality of hollow glass tubes on said table in substantially vertical position in proximity to each of said work stations and for feeding individual ones of said glass tubes to the associated work station on the table by introduction of the lower end of such glass tube into the scoop of such work station wherein each said storing and feeding means includes a support plate tilted downwardly towards the corresponding scoop for supporting said plurality of glass tubes, said plate having a guide spout with an outlet located at a level higher than that of the upper edge of said scoop.

4,138,241
APPARATUS FOR TEMPERING GLASS SHEETS

Harold E. McKelvey, Plymouth, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Jan. 25, 1978, Ser. No. 872,233
Int. Cl.² C03B 27/00
U.S. Cl. 65—351 11 Claims



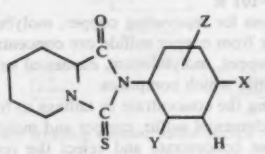
1. In apparatus for tempering flat sheets of glass in combination, a furnace for heating the glass sheets and a plurality of horizontally aligned conveyor rolls for supporting and conveying the glass sheets through the furnace, means for rapidly cooling the heated glass sheets upon issuing from said furnace, said cooling means comprising a plurality of spaced horizontally aligned conveyor rolls extending parallel with said furnace rolls for receiving the glass sheets therefrom, upper and lower horizontal blastheads positioned above and beneath the last-named conveyor rolls respectively, the lower blasthead comprising a plurality of elongated tubular members positioned in the spaces between said conveyor rolls and extending parallel therewith, each tubular member being provided with a cavity for receiving an air flow and having at least one orifice for directing the air against the bottom surface of the glass sheets, and means for mounting said tubular members such that they can be lowered relative to the conveyor rolls from an operative position to an inoperative position to permit broken glass to fall through the spaces between the conveyor rolls vacated by said tubular members.

4,138,242
NOVEL 2-ARYL-2,3,5,6,7,8-HEXAHYDRO-3-THIOXOIMIDAZO-[1,5-A-]PYRIDIN-1(BAH)-ONES AS HERBICIDES

Steven J. Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 667,535, Mar. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 546,698, Feb. 3, 1975, Pat. No. 3,958,976. This application Dec. 7, 1976, Ser. No. 748,297
Int. Cl.² A01N 9/22; C07D 471/04
U.S. Cl. 71—92 2 Claims

1. A method for the control of undesirable vegetation comprising applying to the locus of such undesired vegetation a herbicidally effective amount of a compound of the formula



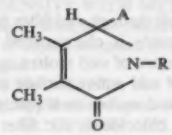
wherein
Z is hydrogen or fluorine;
Y is hydrogen or fluorine; and
X is bromine, chlorine, fluorine, methoxy, cyano, or nitro; provided that when Z is in the meta position and is fluorine, Y must also be fluorine.

4,138,243
NOVEL HETEROCYCLIC COMPOUNDS

Beat Böhner, Binningen, and Marcus Baumann, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,497
Claims priority, application Switzerland, Aug. 12, 1976, 10309/76
Int. Cl.² A01N 9/22; C07D 401/04
U.S. Cl. 71—94 10 Claims

1. 3,4-dimethyl-2-hydroxy-5-oxo-2,5-dihydropyrrole compounds of the formula I



(I)

wherein
A represents the hydroxyl group, a halogen atom or an O-acyl radical, and
R represents a pyridyl radical which is bound by way of a carbon atom and may be substituted by halogen, lower alkyl, lower alkoxy, hydroxy, nitro, amino, cyano, C_1–C_4 alkylcarbonylamino and piperidine.

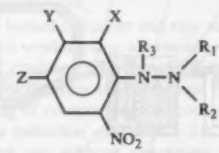
10. A method for combating plant and animal pests which comprises applying to the locus thereof a pesticidally effective amount of 3,4-dimethyl-2-hydroxy-5-oxo-2,5-dihydro-pyrrole compound of the formula I, claim 1.

4,138,244
NITROPHENYLHYDRAZINE COMPOUNDS

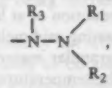
Don L. Hunter, Anaheim; William G. Woods, Fullerton; James D. Stone, Whittier, all of Calif., and Cecil W. LeFevre, Franklin, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Division of Ser. No. 529,655, Dec. 4, 1974. This application Aug. 11, 1976, Ser. No. 713,463
Int. Cl.² A01N 9/20, 9/22, 9/28
U.S. Cl. 71—121 13 Claims

1. The method for controlling weed growth which comprises applying to the locus of said weed growth a phytotoxic amount of a compound of the formula:



wherein X is selected from hydrogen and nitro, Y is selected from lower alkoxy, amino, alkylamino, dialkylamino and



Z is selected from halo and trifluoromethyl, R_1 is lower alkyl, and R_2 and R_3 are each selected from hydrogen and lower alkyl

4,138,245

PROCESS FOR THE REMOVAL OF IMPURITIES FROM ALUMINUM MELTS

Rudolf Stary, Neuhausen am Rheinfall, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 21, 1977, Ser. No. 853,196
Claims priority, application Switzerland, Dec. 21, 1976, 16074/76
Int. Cl.[2] C22B 21/00
U.S. Cl. 75—68 R 13 Claims

1. An improved process for the removal of sodium impurities from molten aluminum and aluminum alloy melts comprising:

providing a filter medium;

coating said filter medium with a metal chloride salt coating so as to form an active surface on said filter medium;

fluxing said molten melt with reactive chlorine gas upstream of said filter medium so as to form aluminum chloride therein; and

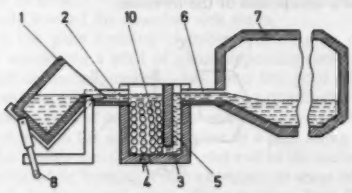
passing said molten melt through said filter medium wherein said aluminum chloride is chemisorbed on said active surface, the temperature of said molten melt being above the melting point of said active surface wherein said sodium impurities in said molten melt reacts with said chemisorbed aluminum chloride on said filter medium active surface so as to remove said sodium impurities from said molten melt such that said molten melt downstream of said filter medium is substantially free of said sodium impurities.

4,138,246

PROCESS FOR LOWERING THE CONCENTRATION OF SODIUM IN ALUMINUM MELTS

Kurt Buxmann; Jean-Daniel Bornand, both of Sierre, and Alfred Steinegger, Venthone, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 22, 1977, Ser. No. 780,225
Claims priority, application Switzerland, Mar. 26, 1976, 3807/76
Int. Cl.[2] C22B 21/06
U.S. Cl. 75—68 R 10 Claims



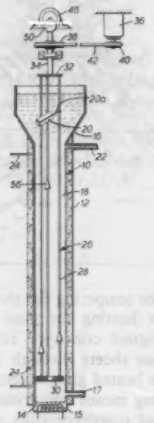
1. In a process for lowering the sodium concentration in an aluminum melt from at least 15 ppm to at most 1 ppm thereby representing a sodium reduction of at least 93%, the improvement which comprises passing said melt through a filter bed of granular material, said granular material being comprised at least in part of carbon, the temperature of said aluminum melt on entry to said filter bed being about 785° C. to 885° C. and the temperature of said aluminum melt at exit from said filter bed being about 770° C. to 870° C. wherein said sodium concentration is reduced to a level of at most 1 ppm.

4,138,247

METHOD FOR PROMOTING SOLIDS-LIQUID FLOW

James D. Esdaile, Glen Waverley; Alan B. Whitehead, Brighton; Graeme W. Walters, Mt. Waverley, and William T. Denholm, Camberwell, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Jul. 12, 1977, Ser. No. 815,003
Claims priority, application Australia, Jul. 19, 1976, 6693/76
Int. Cl.[2] C22B 13/06
U.S. Cl. 75—79 22 Claims



1. A continuous process of the reflux refining of metals comprising transporting impure metal crystals, within a column of a slurry of said crystals close to equilibrium at all times with a more impure form of the liquid metal under conditions of substantially continuous counter current plug flow, from a cool zone through a continuous temperature gradient within the column to a hot zone, wherein melting of the crystals occurs to form a liquid, some of which is displaced toward the cool zone as a countercurrent reflux stream; said transport being facilitated by the use of a mechanical device comprising a plurality of elements movably supported at spaced-apart locations within the column, each element being of small maximum transverse cross-sectional area relative to that of the column, said elements being moved at least reciprocally in the direction of extent of the column, whereby in consequence of the shape and movement of the elements there is, in the vicinity of each element, a nett displacement of crytals towards the hot zone.

4,138,248

RECOVERY OF ELEMENTAL SULFUR AND METAL VALUES FROM TAILINGS FROM COPPER RECOVERY PROCESSES

Kartik A. Narain, Tucson, Ariz., assignor to Cyprus Metallurgical Processes Corporation, Los Angeles, Calif.

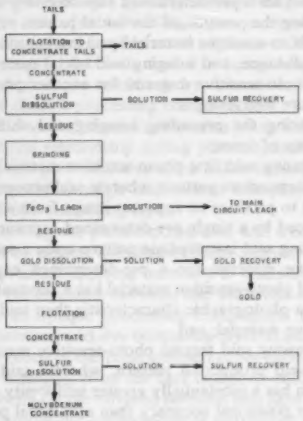
Filed Apr. 10, 1978, Ser. No. 894,515
Int. Cl.[2] C22B 15/08, 11/08, 34/34
U.S. Cl. 75—101 R 23 Claims

1. A process for recovering copper, molybdenum and elemental sulfur from copper sulfide ore concentrates or tailings containing copper, molybdenum, elemental sulfur, pyrite and other impurities which comprises:

a. subjecting the concentrate or tailings to froth flotation to collect elemental sulfur, copper and molybdenum values in a float concentrate and reject the remainder of the tailings;

b. performing a liquid-solids separation on the float concentrate of step (a);

c. leaching the residue of step (b) with a solvent for sulfur to dissolve elemental sulfur;
d. performing a liquid-solids separation on the slurry of step (c);
e. recovering elemental sulfur from the filtrate of step (d);



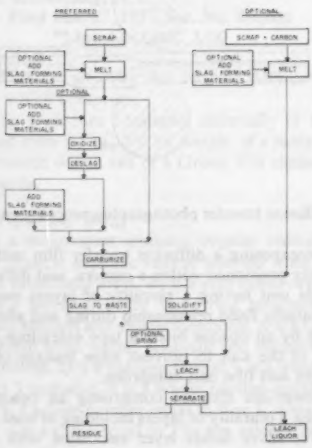
f. leaching the residue of step (d) with ferric chloride to selectively dissolve copper therein;
g. performing a liquid-solids separation on the slurry of step (f)
h. recovering copper from the filtrate of step (g); and
i. recovering molybdenum from the residue of step (g).

4,138,249

PROCESS FOR RECOVERING VALUABLE METALS FROM SUPERALLOY SCRAP

Barry H. Rosof, Indianapolis, Ind., assignor to Cabot Corporation, Boston, Mass.

Filed May 26, 1978, Ser. No. 909,730
Int. Cl.[2] C22B *23/04, 7/04*
U.S. Cl. 75—103 **13 Claims**



1. A method for treating certain metal scraps which comprises:

providing an initial scrap feed containing the combination of (a) at least one metal selected from the group consisting of nickel, cobalt and mixtures thereof, and (b) at least one refractory metal selected from the group consisting of chromium, molybdenum, tungsten and mixtures thereof;

melt carburizing said feed sufficiently to at least predominantly insolubilize the metals of group (b) with respect to the ammoniacal leach step below and to render the group (a) metals of those alloys contained in said feed which are resistant to solution in ammoniacal leach liquor soluble in said ammoniacal leach step; and

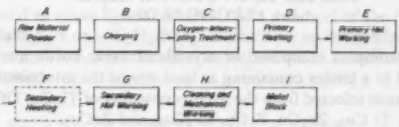
leaching the melt carburized feed with an ammoniacal leach liquor having dissolving power for the metals of group (a), whereby said metals of group (a) pass predominantly into solution in said liquor while the metals of group (b) remain predominantly as undissolved leach residue.

4,138,250

METHOD FOR PRODUCING METAL BLOCK HAVING A HIGH DENSITY WITH METAL POWDER

Yoshihiro Kajinaga, Chiba; Ichio Sakurada, Ichihara, and Shunji Ito, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Nov. 12, 1976, Ser. No. 741,349
Claims priority, application Japan, Nov. 18, 1975, 50-137744
Int. Cl.[2] B22F *1/00, 3/16*
U.S. Cl. 75—201 **11 Claims**



1. A method of producing a high density metal block comprising,

charging raw material powder into a metallic container, said raw material comprising metal powder having a particle size of not larger than 1 mm,

placing a partition plate on the raw metal powder, disposing carbonaceous powder on top of said partition plate, the latter preventing the carbonaceous powder from directly contacting the raw material powder, said carbonaceous powder heating, generating and maintaining an oxidation protecting atmosphere,

disposing a metallic cover having a gas hole therein on said container to form an enclosure with said partition plate,

uniformly heating the contained raw material powder in atmospheric air at a temperature within the range (M.P. × 0.67)° C. to (M.P. − 50° C.), where M.P. is the melting point in degrees Centigrade at which the raw material powder begins to melt,

subjecting the heated container and raw material powder to a primary hot working step in atmospheric air to obtain a hot worked compact body having a relative density of 64–96% of the theoretical density, said primary hot working consisting of compressing the contained raw material to achieve a reduction ratio of 1.5–2.0, said compressing being carried out without restraining the pressure-free side walls of the container, and further compressing the contained raw material powder to achieve a total reduction ratio, inclusive of said 1.5–2.0, of less than 5.6, said further compressing being carried out while restraining said side walls,

subjecting the said primarily hot worked compact body to a secondary hot working to obtain a secondarily worked metal block having a relative density of 95–100% of the theoretical density, said secondary hot working consisting of compressing the primarily hot worked compact to achieve a reduction ratio of at least 1.5 or a reduction in sectional area of at least 30%.

4,138,251
ELECTRICAL CONTACT MATERIAL

Hans G. Hirsbrunner, Attleboro, Mass., and Stephen B. Goldman, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 31, 1977, Ser. No. 801,503
Int. Cl.[2] B22F *3/00*
U.S. Cl. 75—234 **4 Claims**

1. An electrical contact material comprising a homogeneous, pressed and sintered mixture of from 85 to 90 percent silver metal powder, from 7.5 to 14.3 percent cadmium oxide powder, and from 0.50 to 3.0 percent zinc oxide powder, by weight, wherein the weight ratio of the zinc oxide to cadmium oxide content of the material is in the range from 0.05 to 0.25.

4,138,252
CUBIC BORON NITRIDE IN A BINDER AND METHOD FOR ITS PRODUCTION

Leonid F. Vereschagin, Kutuzovsky prospekt, 2/1, kv. 231; Aik A. Semerchian, Kutuzovsky prospekt, 2/1, kv. 205, both of Moscow; Tamara T. Gankevich, Podolsky raion, Akademgorodok, ulitsa Shkolnaya, 6, kv. 16, Moskovskaya oblast; Mikhail E. Dmitriev, Podolsky raion, Akademgorodok, ulitsa Shkolnaya, 4, kv. 64, Moskovskaya oblast, and Vitaly P. Modenov, Podolsky raion, Akademgorodok, ulitsa Tsentralnaya, 10, kv. 42, Moskovskaya oblast, all of U.S.S.R.

Filed Jun. 10, 1977, Ser. No. 805,310
Int. Cl.[2] C22C *29/00*
U.S. Cl. 75—244 **7 Claims**

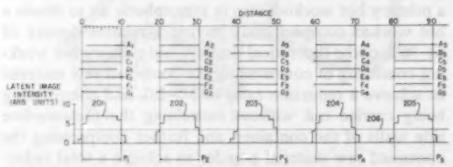
1. A compact composed of crystals of cubic boron nitride sintered to a binder containing at least one of the intermetallic compounds selected from the group consisting of Ti_2Cu, TiCu, Ti_2Cu_3, Ti Cu_3, Zr_2Cu, ZrCu, Zr_2Cu_3, and $ZrCu_3$.

5. Method of producing a compact, which comprises subjecting a composition comprising cubic boron nitride and a binder containing at least one of the intermetallic compounds selected from the group consisting of Ti_2Cu, TiCu, Ti_2Cu_3, $TiCu_3$, Zr_2Cu, ZrCu, Zr_2Cu_3, and $ZrCu_3$, to a combined pressure of 10 to 50 kilobars and a temperature of 1000° C. to 1400° C., thereby sintering said cubic boron nitride to said intermetallic compound to form a compact of high strength and cutting properties.

4,138,253
METHOD FOR MAKING A MEMBER OF A POSITION MEASURING TRANSDUCER

Clair L. Farrand, Bronxville, N.Y., assignor to Farrand Industries, Inc., Valhalla, N.Y.

Continuation of Ser. No. 516,049, Oct. 18, 1974, abandoned. This application Jan. 20, 1978, Ser. No. 871,164
Int. Cl.[2] G03C *5/04, 5/00, 5/32*
U.S. Cl. 96—27 E **5 Claims**



1. In a method for making a member of a position measuring transducer having a pattern of uniformly pitched bars thereon formed by an operation in which a production pattern is optically imaged upon a photosensitive surface of said member, said surface thereafter being photo-chemically treated, said production pattern being formed by means of an intermediate pattern, said intermediate pattern, in turn, being formed by means of an initial pattern, the improvement comprising the steps of:

(a) providing said initial pattern of a plurality of bars having substantially uniform pitch;

(b) providing a first unexposed photo-sensitive material having a density/log exposure ranging between a lower and a higher exposure value;

(c) imaging said initial pattern upon said first photo-sensitive material for a pre-determined exposure step level;

(d) shifting the position of the initial pattern relative to the first photo-sensitive material by an integer multiple of said pitch distance, and imaging said initial pattern upon the first photo-sensitive material for another pre-determined exposure step level;

(e) repeating the preceding imaging and shifting steps a plurality of times;

(f) processing said first photo-sensitive material to produce said intermediate pattern, wherein said processing is insufficient to produce an apparent image from a latent image produced by a single pre-determined exposure step level;

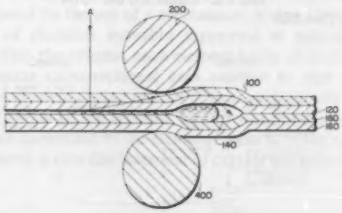
(g) imaging said intermediate pattern upon a second photo-sensitive material for a pre-determined exposure, said second photo-sensitive material has a substantially higher gamma photographic characteristic than said first photo-sensitive material; and

(h) processing said second photo-sensitive material to produce said production pattern, wherein said production pattern has a substantially greater uniformity of pitch and greater positional accuracy than said initial pattern.

4,138,254
PHOTOGRAPHIC PRODUCTS COMPRISING ANTI-LIGHT PIPING DYES

Howard G. Rogers, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 408,052, Oct. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 194,406, Nov. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 101,841, Dec. 28, 1970, abandoned. This application Jul. 2, 1976, Ser. No. 702,149
Int. Cl.[2] G03C *7/00, 1/40, 1/84, 5/54*
U.S. Cl. 96—29 D **19 Claims**



16. A diffusion transfer photographic process comprising the steps of:

(A) photoexposing a diffusion transfer film unit in a dark chamber positioned within a camera, said diffusion transfer film unit having a plurality of layers maintained in substantially fixed relationship during and after photoexposure by an opaque binding tape extending around the edges of the unit to prevent edge leakage of light and wherein said film unit comprises;

a first sheet-like element comprising an opaque support carrying a plurality of layers including at least one photosensitive silver halide layer associated with a diffusion transfer process dye image-providing material;

a rupturable container releasably holding an aqueous, alkaline, opaque processing composition including a light-reflecting pigment, said rupturable container being positioned transferse a leading edge of said film unit so as to release said processing composition for distribution be-

tween said first sheet-like element and a second sheet-like element subsequent to photoexposure;

said second sheet-like element comprising a transparent support carrying an image-receiving layer, a transparent layer carried by said support containing a quantity of a dye effective to reduce the light-piping capability of said transparent layer, said quantity further being effective to impart to said dye containing layer an optical density greater than about 5 as measured edgewise at 700 mμ over a path length of 1 inch, said dye being adapted to be rendered nonlight-absorbing by interaction with said aqueous alkaline processing composition;

said first and second sheet-like elements being held in superposed, fixed relationship during photoexposure and processing, said photosensitive silver halide emulsion layer(s) being exposed through said second transparent support and said dye containing layer;

(B) withdrawing the photoexposed film unit from the dark chamber by passing the photoexposed film unit between a pair of pressure applying members to distribute the contents of the container between said sheet-like elements to provide an opaque processing composition layer positioned between said dye containing layer(s) and covering those portions of the photoexposed silver halide emulsion layer(s) emerging from the dark chamber; and,

(C) transporting those covered portions into light before the opaque processing composition is distributed to all portions of the photoexposed silver halide layer(s), said covered portions and said quantity of dye in said transparent layer being effective during distribution of said processing composition to prevent light incident on said covered portions from fogging said photoexposed photosensitive layer(s), said distributed processing composition providing a light reflecting layer against which a color transfer image can be viewed through said transparent support without separation of said superposed first and second elements.

4,138,255

PHOTO-CURING METHOD FOR EPOXY RESIN USING GROUP VIa ONIUM SALT

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,036

Int. Cl.[2] G03C *5/00*

U.S. Cl. 96—35.1 **7 Claims**

1. A method for effecting the cationic polymerization of epoxy resin which comprises,

(1) forming a mixture consisting essentially of the epoxy resin and from 0.1 to 15% by weight of a radiation sensitive aromatic onium salt of a Group VIa element having the formula,

$$[(R)_a(R^1)_b(R^2)_cX]^+[MQ_e]^{-(e-f)},$$

where R is a monovalent aromatic organic radical, R^1 is a monovalent organic aliphatic radical selected from alkyl, cycloalkyl and substituted alkyl, R^2 is a polyvalent organic radical forming a heterocyclic or fused ring structure selected from aliphatic radicals and aromatic radicals, X is a Group VIa element selected from sulfur, selenium and tellurium, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 to 3 inclusive, b is a whole number equal to 0 to 2 inclusive, c is a whole number equal to 0 or 1, where the sum of a + b + c is a value equal to 3 or the valence of X,

d=e−f,

f=valence of M and is an integer equal to from 2 to 7 inclusive,

e is >f and is an integer having a value up to 8,

(2) exposing said mixture to radiant energy to effect the cure of the orgaic material.

4,138,256

METHOD OF PROCESSING PHOTOGRAPHIC SILVER DYE BLEACH MATERIALS

Christoph Chylewski; Gérald Jan, both of Marly; Roland Kurzen; Max Meier, both of St. Antoni, and Matthias Schellenberg, Marly, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 11, 1976, Ser. No. 740,710

Claims priority, application Switzerland, Nov. 17, 1975, 14861/75

Int. Cl.[2] G03C *7/00, 5/24, 5/30, 5/32*

U.S. Cl. 96—53 **14 Claims**

1. A method of processing imagewise exposed photographic silver dye bleach materials involving the process steps

(1) silver developing,

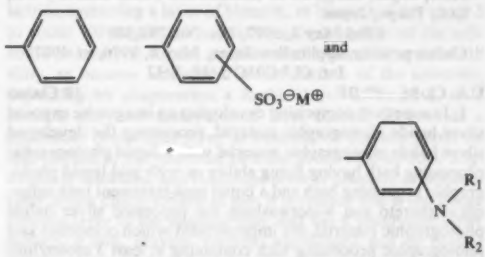
(2) dye bleaching,

(3) silver bleaching,

(4) fixing,

it being possible to combine process step (3) with at least one of the process steps (2) and (4) in a single treatment step, which method comprises using in at least one of the steps (2), (3) or (4) a water-soluble tertiary phosphine of the formula

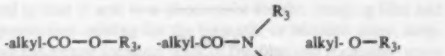
is used as silver ligand, wherein W is a radical of the formula $-C_rH_{2r}CN$ or $-C_2H_{2r}NO_2$, in whichr is an integer from 1 to 25, a pyridine, pyrazine or triazine radical or a radical of the formulae



wherein $M^{\oplus}$ is a cation and each of R_1 and R_2 is independently a hydrogen atom or an alkyl group of 1 to 4 carbon atoms, X is

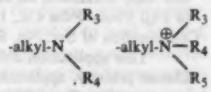
$-(CH_2-CH_2O)_n-R_3$, -alkyl-$SO_3^{\ominus}M^{\oplus}$,

-alkyl-SO_2—U, -alkyl-$PO_3^{\ominus\ominus}M^{\oplus}M^{\oplus}$,



-alkyl-CO—O—R_3, -alkyl-CO—N(—R_3, —R_4), alkyl- O—R_3,

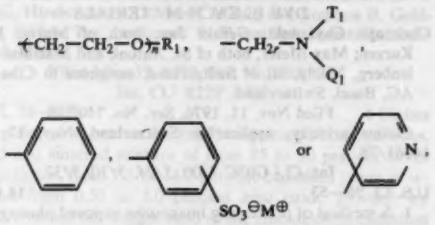
-alkyl-O—OC—R_3, -alkyl-CN, -alkyl-NO_2,



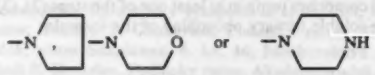
or alkyl-halogen, wherein the alkyl moiety contains 1 to 15 carbon atoms, $M^{\oplus}$ is a cation, each of R_3, R_4 and R_5 is independently a hydrogen atom or an alkyl group of 1 to 4 carbon atoms, U is an alkyl group of 1 to 4 carbon atoms and n is an integer from 1 to 5, and Y is a radical of the formula

$-C_rH_{2r}SO_3^{\ominus}M^{\oplus}$, $-C_rH_{2r}-O-R_1$,

-continued



wherein n is an integer from 2 to 5, r is an integer of 1 to 25 and $M^{\oplus}$ is a cation, each of R_1, Q_1 and T_1 is independently a hydrogen atom or an alkyl group of 1 to 4 carbon atoms, Q_1 and T_1 together with the nitrogen atom to which they are attached can also form one of the radicals of the formulae



and X and Y together are $-CH_2-CH_2-NR_1-CH_2-CH_2-$, wherein R_1 has the indicated meaning.

4,138,257

PROCESS FOR THE TREATMENT OF PHOTOGRAPHIC MATERIALS

Isamu Fushiki; Sigeharu Koboshi, and Sadatugu Terada, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 2, 1977, Ser. No. 792,559

Claims priority, application Japan, May 4, 1976, 51-49875

Int. Cl.[2] G03C *5/38, 5/32*

U.S. Cl. 96—60 BF **10 Claims**

1. In a method comprising developing an imagewise exposed silver halide photographic material, processing the developed silver halide photographic material with a liquid photographic processing bath having fixing ability or with said liquid photographic processing bath and a liquid post-treatment bath subsequent thereto and waterwashing the processed silver halide photographic material, the improvement which comprises said photographic processing bath containing at least 3 moles/liter of bromine ion or at least 1.3 moles/liter of iodine ion, as the sole fixing agent at least one of said photographic processing bath and said post-treatment bath containing a polymer having, in the molecular structure, pyrrolidone nucleus units and a molecular weight of about 2,000 to 500,000, said polymer being present in said photographic processing bath in an amount of 5 to 200 grams per liter or in said post-treatment bath in an amount of 5 to 400 grams per liter.

4,138,258

MULTI-LAYERED COLOR PHOTOGRAPHIC MATERIALS

Takeshi Hirose; Keisuke Shiba; Yukio Yokota; Kozo Inouye, and Akio Okumura, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

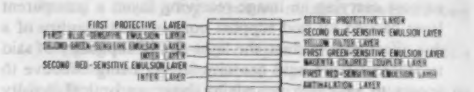
Continuation of Ser. No. 608,801, Aug. 28, 1975, abandoned. This application Jun. 9, 1977, Ser. No. 805,070

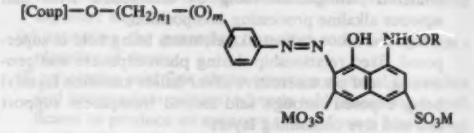
Claims priority, application Japan, Aug. 28, 1974, 49-98469

Int. Cl.[2] G03C *1/76, 7/16, 7/00, 1/40*

U.S. Cl. 96—74 **1 Claim**

1. A multi-layer color photographic material comprising a support having thereon at least a blue-sensitive silver halide emulsion layer containing a yellow dye-forming coupler, a green-sensitive silver halide emulsion layer containing a magenta dye-forming coupler, and a red-sensitive silver halide emulsion layer containing a cyan dye-forming coupler, said red-sensitive layer or a gelatin interlayer adjacent said red-sensitive layer containing a non-diffusible colored cyan coupler of the formula





wherein Coup represents a 1-naphtholic cyan coupler residue substituted at the coupling position or a phenolic cyan coupler residue substituted at the coupling position, M represents a hydrogen atom or a monovalent cation, R represents an alkyl group, a phenol group or a naphthol group; n_1 is an integer of from 1 to 4; m is 0 or 1; and said cyan coupler releases on coupling reaction with the oxidation product of a primary aromatic amino developing agent, a diffusible dye capable of being leached from the photographic layer during the development process.

4,138,259

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Keiichi Adachi; Tadao Shishido; Hiroshi Hara, and Shigeo Hirano, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

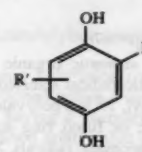
Filed Oct. 28, 1977, Ser. No. 846,469

Claims priority, application Japan, Oct. 29, 1976, 51/130768

Int. Cl.[2] G03C *1/76, 1/40*

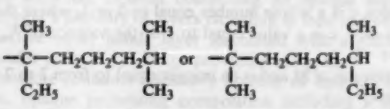
U.S. Cl. 96—74 **20 Claims**

1. A color photographic silver halide light-sensitive material comprising a support having thereon a silver halide photographic emulsion layer having a dye image providing material associated therewith and with the light-sensitive material containing an isomeric mixture of compounds represented by the following general formula (I) or precursors thereof:



(I)

wherein R and R', which may be the same or different, each represents



and at least one non-coupling phenolic compound having an ether bond at the 4-position thereof.

4,138,260
PHOTOGRAPHIC FILM UNIT WITH CROSSLINKED NEUTRALIZATION LAYER

Werner Krafft, Leverkusen, and Günter Helling, Siegburg, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 14, 1977, Ser. No. 851,310

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1976, 2652464

Int. Cl.² G03C *1/40, 7/00, 5/54*

U.S. Cl. 96—77 **4 Claims**

1. A photographic film unit for the production of colored transfer images, comprising a dimensionally stable layer support, an image receptor layer, a light-sensitive element having at least one light-sensitive silver halide emulsion layer and a non-diffusible dye-providing compound associated therewith,

and a neutralisation system consisting of a neutralisation layer having a polymer which contains free acid groups and a barrier layer which retards neutralisation,

said neutralisation system being located on one side of a laminate consisting of said light sensitive element and said image receptor layer with said barrier layer of said system arranged between said laminate and said neutralisation layer,

wherein the improvement comprises the neutralisation layer contains a crosslinked copolymer consisting of 30 to 99 mol % of copolymerized acrylic acid or methacrylic acid units and 1 to 30 mol % of copolymerized units of a crosslinking agent having at least two copolymerizable carbon-carbon double bonds, the balance being copolymerised units selected from the group consisting of copolymerizable monomeric compounds containing a copolymerizable carbon-carbon-double bond and a sulfonic acid group and copolymerizable monomeric compounds free from acid groups, selected from alkyl acrylates, cycloalkyl acrylates, alkyl methacrylates and cycloalkyl methacrylates,

said copolymer being crosslinked through said crosslinking agent having at least two copolymerizable double bonds.

4,138,261
HARDENERS FOR USE IN WATER-GLASS CEMENT COMPOSITIONS AND PROCESS FOR MAKING THEM

Renate Adrian; Raban von Schenck, both of Hürth; Bernd Cox, Elz, and Peter Wirtz, Königsstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,727

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709189

Int. Cl.² C04B *31/02*

U.S. Cl. 106—84 **5 Claims**

1. Hardeners of condensed aluminum phosphates containing P_2O_5 and Al_2O_3 in a molar ratio of at least 1.5:1, for use in water-glass cementing compositions, the hardeners consisting substantially of a component A comprising a short chain aluminum polyphosphate with a chain length of 3 to 6, corresponding to a water content of 6 to 4 weight %, and a component B comprising a long chain aluminum polyphosphate with a chain length of more than 40, corresponding to a water content of less than 0.5 weight %, quick-setting hardeners containing a high proportion of said component A and slow-setting hardeners containing a high proportion of said component B.

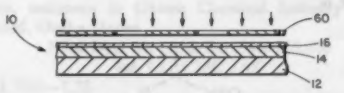
4,138,262
IMAGING FILM COMPRISING BISMUTH IMAGE-FORMING LAYER

Harvey H. Wacks; Masatsugu Izu, both of Birmingham, and Donald J. Sarrach, Novi, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Sep. 20, 1976, Ser. No. 724,993

Int. Cl.² G03C *1/78, 5/00*

U.S. Cl. 96—87 R **8 Claims**



1. A method of making an imaging film for use in the graphic arts comprising: providing a flexible, non-outgassing, transparent plastic sheet material having a thickness of from about 2 to 7 mils and being substantially free of voids and surface irregularities, sputtering a layer of bismuth, or bismuth alloy, about 5 to about 100 angstroms in thickness on a surface of the substrate to cause at least a portion of the bismuth, or bismuth alloy, to become embedded in said surface of the substrate, depositing by evaporation a further layer of bismuth, or a bismuth alloy, on the sputtered layer thereof, to provide a combined, continuous layer of bismuth, or bismuth alloy, on said surface of the substrate of from about 1500 to 3500 angstroms in thickness, said combined layer of bismuth, or bismuth alloy, being characterized in that it is opaque and is the image forming layer of the imaging film, and has a roughened outer surface, a dull, grayish, metallic appearance and an optical density of about 3.5 to about 7, and applying a layer of a photosensitive, latent image forming organic material on the roughened outer surface of the bismuth, or bismuth alloy, layer to convert the dull, grayish, metallic appearance of the bismuth, or bismuth alloy, layer to a black, non-reflective condition, said layer of photosensitive material being about 0.5 to about 5 microns in thickness and having a hardness of not less than 3.5 on the Mohs scale, said photosensitive material being characterized in that it acts as a photoresist for the imaging film and as a protective coating for the bismuth, or bismuth alloy, comprising the image forming layer of the film and is capable upon the application of radiant energy thereto of changing between two states, one of which is a state in which the energy sensitive material is substantially soluble with respect to a given solvent, and the other being a state in which the energy sensitive material is substantially insoluble with respect to said solvent, thereby enabling a latent image corresponding to a preselected pattern to be formed therein, said imaging film having a substrate side which is shiny and metallic in appearance and a photosensitive material side which is black and substantially non-reflective in appearance thereby enabling the photosensitive material side of the film to be readily distinguished from the substrate side of the film, said imaging film being characterized in that is has a resolution of the order of 600 lines/mm and a gamma of about 20, or more, and a constant maximum optical density of about 5 and a constant minimum optical density of about 0.02.

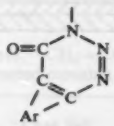
4,138,263

PHOTOGRAPHIC SILVER HALIDE MATERIAL WITH 2-EQUIVALENT, N-HETEROCYCLIC YELLOW COUPLERS

Immo Boie; Günter Renner, both of Cologne, and Friedrich-Wilhelm Kunitz, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 532,904, Dec. 16, 1974, abandoned. This application Aug. 13, 1975, Ser. No. 604,312
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1973, 2363675
Int. Cl.[2] G03C *1/40, 7/00*
U.S. Cl. 96—100 N **9 Claims**

1. In a light-sensitive material having a silver halide emulsion layer in effective contact with a 2-equivalent yellow coupler carrying a nitrogen-containing 6-membered heterocycle connected by said nitrogen atom to the coupling position of an open-chain ketomethylene yellow coupler and having a carbonyl carbon adjacent said nitrogen, which heterocycle splits off during coupling, the improvement according to which said heterocycle is



in which Ar is a carbocyclic aromatic ring fused to the two carbons to which it is connected.

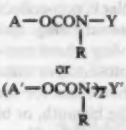
4,138,264

SILVER HALIDE EMULSION CONTAINING TWO EQUIVALENT TYPE COUPLER FOR USE IN PHOTOGRAPHY

Hajime Wada; Kazuhiko Kimura; Haruo Hori; Shoji Kikuchi, and Takaya Endo, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

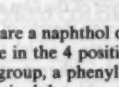
Continuation of Ser. No. 656,346, Feb. 9, 1976, abandoned, which is a continuation of Ser. No. 472,477, May 22, 1974, abandoned. This application Jan. 26, 1978, Ser. No. 872,387
Claims priority, application Japan, May 23, 1973, 48-57829
Int. Cl.[2] G03C *1/40*
U.S. Cl. 96—100 R **4 Claims**

1. A silver halide sensitive photographic material comprising a photosensitive emulsion layer, said layer containing the coupler represented by the formula:



[I]

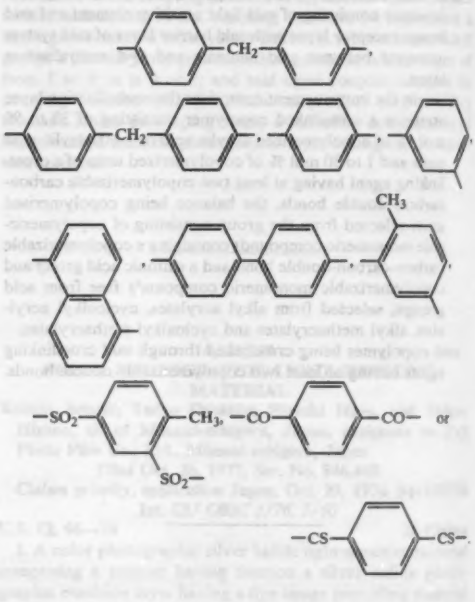
or



[II]

wherein A and A′ are a naphthol or phenol type cyan coupler monovalent residue in the 4 position, R is hydrogen, an alkyl group, an alkenyl group, a phenyl group, a naphthyl group, a pyridyl group, a quinolyl group, a thienyl group, a piperidyl group or an imidazolyl group all of which groups can have a substituent or substituents which are selected from halogen, nitro, carboxy, amino, a substituted amino group, a sulfo group, an alkyl group, an alkenyl group, a phenyl group, a naphthyl group, an alkoxy group, an aryloxy group, an arylthio group, an arylazo group, an acylamino group, a carbamoyl group, an ester group, an acetyl group, an acyloxy group, a sulfonamido group, a sulfonyl group, a morpholino group, a piperazyl group and an imidazolyl group; Y is an acetyl group, a benzoyl group, a napthoyl group, an alkyl group, a phenyl group, a naphthyl group, a pyridyl group, a quinolyl group, a thienyl group, a piperidyl group or an imidazolyl group all of which groups can have a substituent or substituents which are selected from halogen, nitro, hydroxyl, carbamoyl, amino, a substituted amino group, a sulfo group, an alkyl group, an alkenyl group, a phenyl group, a naphthyl group, an arylazo group, an acylamino group, an ester group, an acetyl group, an acyloxy group, a sulfon amido group, a sulfonyl group, a morpholino group, a piperazyl group and an imidazolyl group, or $-SO_2-R_2$ in which R_2 is an alkyl or alkenyl group which can have a substituent or substituents which are selected from halogen, nitro, hydroxyl, carbamoyl, a sulfo group, amino, a substituted amino group, a phenyl group, a naphthyl group, an alkoxy group, an aryloxy group, an arylthio group, an arylazo group, an acylamino group, an ester group, an acetyl group, an acyloxy group, a sulfonamido group, a sulfonyl group, a morpholino group, a piperazyl group and an imidazolyl group, and Y′ is oxygen, sulfur, amino, carboxyl, an aminocarbonyl group, a carbonyl group, a thiocarbonyl group, a sulfonyl group,

$-CH_2-CH_2-$, $-(CH_2CH_2)_3-$,



4,138,265

ANTIFOGGANTS IN CERTAIN PHOTOGRAPHIC AND PHOTOTHERMOGRAPHIC MATERIALS THAT INCLUDE SILVER SALTS OF 3-AMINO-1,2,4-MERCAPTOTRIAZOLE

Daniel D. Shiao, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

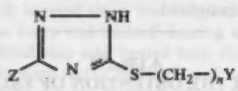
Filed Jun. 27, 1977, Ser. No. 810,141
Int. Cl.[2] G03C *1/02, 5/24, 5/30, 1/34*
U.S. Cl. 96—114.1 **44 Claims**

1. A photographic element for producing a dye enhanced silver image comprising a support having thereon, in reactive association,

(a) photosensitive silver halide,

(b) an image-forming combination comprising

(i) a silver salt of a 1,2,4-mercaptotriazole represented by the formula:



wherein Y is aryl containing 6 to 12 carbon atoms; n is 0 to 2; and Z is hydrogen, hydroxyl or $—NH_2$; with

(ii) a phenylenediamine or aminophenol silver halide developing agent,

(c) a compound that contains a coupling moiety and which forms a dye upon reaction with the oxidized form of said developing agent,

(d) a binder, and

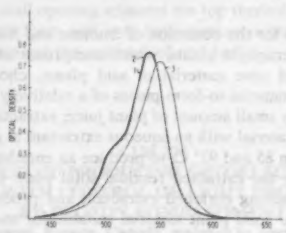
(e) an antifoggant concentration of a thiazoline thione antifoggant.

4,138,266

METHOD FOR SPECTRALLY SENSITIZING PHOTOGRAPHIC LIGHT-SENSITIVE EMULSIONS

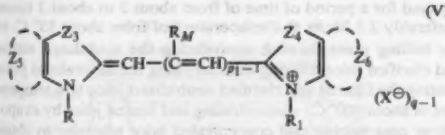
Masanao Hinata; Yuji Mihara; Tadao Shishido, and Keiichi Adachi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 644,004, Dec. 24, 1975, abandoned. This application Feb. 3, 1977, Ser. No. 765,314
Claims priority, application Japan, Dec. 24, 1974, 49-946
Int. Cl.² G03G 5/09; G03C 1/10, 1/114, 1/02
U.S. Cl. 96—123 **12 Claims**



1. A method of spectrally sensitizing a photographic light-sensitive emulsion which comprises adding thereto an aqueous solution of a sulfo-substituted cyanine dye represented by the following general formula (VI')

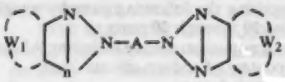
(VI')



wherein Z_3 and Z_4 each represents

$$—O—,\ —\overset{|}{N}—R_0,\ —S—\ \text{or}\ —Se—,$$

wherein R_0 represents an alkyl group or a substituted alkyl group; Z_5 and Z_6 each represents an atomic group necessary to form a benzene ring or a naphthalene ring; R_M represents a hydrogen atom, an alkyl group, an aryl group, or a substituted aryl group; R and R_1 each represents an alkyl group or an aryl group, with either R or R_1 representing a sulfo group-containing alkyl group; p_1 represents 1 or 2; q represents 1 or 2; X represents an inorganic acid anion or an organic acid anion; and a Red Shift Compound represented by the following general formula (V)



(V)

wherein —A— is a divalent aromatic residue, and W_1 and W_2 each represents an atomic group necessary to form a benzene ring or a naphthalene ring, where the benzene ring or naphthalene ring is substituted with one or more groups including at least one sulfo group, where the molar ratio of the amount of said sulfo-substituted cyanine dye represented by the general formula (VI') to the amount of said Red Shift Compound represented by the general formula (V) ranges from about 1:1 to about 1:2.

4,138,267

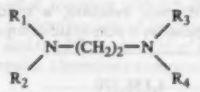
COMPOSITIONS FOR CHEMICAL COPPER PLATING

Yasunori Arisato, Daito, and Hideaki Koriyama, Nara, both of Japan, assignors to Okuno Chemical Industry Company, Limited, Osaka, Japan

Filed Dec. 28, 1976, Ser. No. 755,030
Int. Cl.² C23C 3/02
U.S. Cl. 106—1.23 **9 Claims**

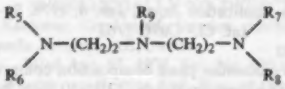
1. A composition for chemical copper plating which consists essentially of

1. a water-soluble copper compound in an amount of about 0.01 to about 0.2 mole per liter of the composition,
2. a boron hydride compound selected from the group consisting of sodium borohydride and potassium borohydride in an amount of about 0.002 to about 0.04 mole per liter of the composition,
3. a copper complexing agent selected from the group consisting of at least one of hydroxyalkyl-substituted ethylenediamines represented by the formula



(I)

wherein R_1, R_2, R_3 and R_4 are the same or different hydroxyl-substituted lower alkyl, and hydroxyalkyl-substituted diethylenetriamines represented by the formula



(II)

wherein R_5, R_6, R_7 and R_8 are the same or different hydroxyl-substituted lower alkyl and R_9 is hydrogen or hydroxyl-substituted lower alkyl in an amount of about 1 to 10 times the amount of the water-soluble copper compound in terms of mole, and optionally

4. at least one of stabilizers selected from the group consisting of sodium cyanide, potassium ferrocyanide, 2-mercaptobenzothiazole, 2-mercaptobenzoimidazole, diethylthiourea and phenylthiourea in an amount of about 5 to about 500 mg. per liter of the composition, said composition having pH of 12 to 14.

4,138,268

COHERENT RIGID SOLID MATERIAL

Edward G. Vogel, Lebanon, and Rodney C. Westlund, Lansdale, both of Pa., assignors to Lebanon Steel Foundry, Lebanon, Pa.

Continuation-in-part of Ser. No. 782,950, Mar. 30, 1977. This application Nov. 14, 1977, Ser. No. 851,407
Int. Cl.² C04B 35/16
U.S. Cl. 106—84 **38 Claims**

1. A coherent rigid solid material made from a mixture

subjected to heat so as to reduce the original content of water, said mixture comprising the following parts by weight:

expanded perlite **20** through **50** parts;

sodium silicate or potassium silicate including 9.5 through 19 parts solids content of sodium silicate itself;

zinc oxide **2** through **9** parts;

sodium fluosilicate **1** through **6** parts; and

water, to make a total of water, including any that may be associated with the sodium silicate of 21.5 through 67 parts.

4,138,269

CONVERSION OF VISCOUS, REACTIVE CHLORINE- AND SULFUR-CONTAINING PRODUCTION RESIDUES INTO SOLID PRODUCTS WHICH CAN BE DUMPED

Bruno Sander, Ludwigshafen; Albrecht Mueller, Frankenthal; Hans Merkle, and Gerhard Janisch, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,719

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638224

Int. Cl.[2] **C04B** *7/02*

U.S. Cl. 106—90 **4 Claims**

1. A process for converting viscous, reactive, chlorine- and sulfur-containing production residues into products which can be dumped, by treatment with alkaline materials, which comprises mixing in the absence of added water a dry, pulverulent, absorbent, alkaline solid and a reactive, viscous chlorine- and sulfur-containing production residue which reacts vigorously with water and evolves toxic and corrosive vapors, the proportions of said alkaline solid and said residue being such that a pulverulent solid to pasty mixture is formed, and adding to said solid or pasty mixture an amount of water in the range of 1 to 60 parts of water per 100 parts of said production residue and sufficient to produce, after an exothermic reaction of said mixture with said water with evolution of gases and vapors produced in the exothermic reaction, a solid free-flowing product ready for disposal as a non-toxic composition.

4,138,270

AQUEOUS ALUMINUM PASTE COMPOSITION

Shizuo Ishijima, Fuji, and Tsunesuke Doi, Tama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 6, 1977, Ser. No. 803,924

Claims priority, application Japan, Jun. 8, 1976, 51-66078

Int. Cl.[2] **C09C** *1/62*

U.S. Cl. 106—291 **9 Claims**

1. An aqueous aluminum paste composition comprising 100 parts by weight of aluminum flakes, 0.1 to 10 parts by weight of at least one fatty acid, 0.01 to 1.0 part by weight of at least one fatty acid alkanolamide, 0.5 to 4.0 parts by weight of a nonionic surface active agent other than the fatty acid alkanolamide and water in an amount sufficient to render the composition pasty, the total amount of the fatty acid alkanolamide and the nonionic surface active agent being at least 1.0 part by weight.

4,138,271

PROCESS FOR PREPARING CARAMEL

Toshiaki Ohira, Sagamihara; Eisuke Hara, Yokohama, and Yasuo Takagi, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 14, 1977, Ser. No. 842,252

Int. Cl.[2] **C13L** *1/08, 1/10;* **A23G** *3/00*

U.S. Cl. 127—34 **6 Claims**

1. A process for preparing a caramel product which comprises admixing a pre-gelatinized starch or a dextrin with water and an acidic reagent in an amount sufficient to provide a total moisture content of from about 10% to about 30% by weight and to give a pH of from about 1.5 to 4.0 and extruding the mixture at an elevated temperature and pressure through an orifice into a substantially atmospheric environment, whereby the mixture is caramelized.

4,138,272

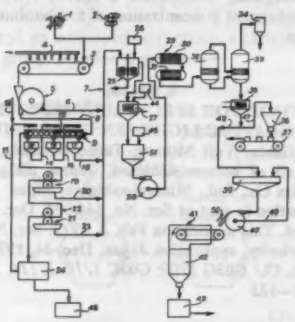
PROCESS FOR THE OBTENTION OF FRUCTOSE AND FRUCTOSE-RICH SYRUPS FROM XEROPHYTE PLANTS

Enrique Zepeda-Castillo, deceased, late of Jalisco, and by Isaura N. Vda. de Zepeda, executrix, Juan Bernardino 249, Guadalajara 5, Jalisco, Mexico

Filed Nov. 15, 1977, Ser. No. 851,657

Int. Cl.[2] **C13C** *1/00;* **C13D** *3/02;* **C13K** *11/00*

U.S. Cl. 127—37 **11 Claims**



1. A process for the obtention of fructose and fructose-rich syrups from xerophyte plants, which comprises: washing the mixed leaf and core material of said plants, chopping the washed plant material to form pieces of a relatively small size and a relatively small amount of plant juice; extracting at least the chopped material with an aqueous extractant at a temperature of between 85 and 92° C. to produce an enriched extractant, expressing the extracted residual solid plant material to expell the remaining enriched extractant and produce an extracted residual solid plant material suitable for use as a raw material in a cellulose process; admixing the enriched extractant streams obtained from the above steps in order to obtain a mixed juice; settling and clarifying said mixed juice to remove the impurifying solids; acidulating a liquid phase of the process at a preselected stage of the sequence such that the thus obtained settled and clarified juice will be brought to a pH of from about 3 to about 4; allowing said acidulated liquid phase to stand for a period of time of from about 2 to about 3 hours, preferably 2.5 hours at a temperature of from about 85° C. to the boiling point thereof; neutralizing the acidulated settled and clarified juice filtering and clarifying the neutralized juice; heating the filtered and clarified neutralized juice to a temperature of about 100° C.; concentrating said heated juice by evaporation; pasteurizing said concentrated juice whereby to obtain a fructose-rich sweetener syrup; and crystallizing at least a part of said fructose-rich syrup to recover crystallized fructose therefrom.

4,138,273

METHOD FOR CLEANING STRIP

Frederick S. Lukac, New Kensington, and William P. Zbryski, Tarentum, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

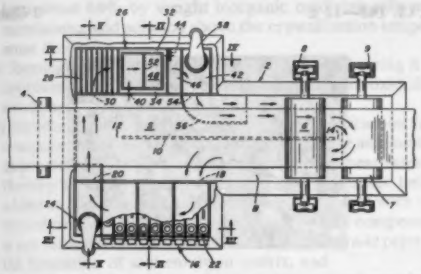
Division of Ser. No. 769,496, Feb. 17, 1977, Pat. No. 4,093,472. This application Feb. 27, 1978, Ser. No. 881,202

Int. Cl.[2] **B08B** *1/02, 3/00*

U.S. Cl. 134—10 **1 Claim**

1. A method of cleaning strip which comprises passing said strip through a molten salt bath in a main tank having a central longitudinal baffle extending short of each end of the tank,

circulating said bath from said main tank through an opening to a heating tank located along one longitudinal side of said main tank at the entry end thereof, heating said bath in said heating tank, circulating said heated bath through a bottom opening to the forward end of said main tank with the majority of said heated bath passing forward of said baffle through a bottom opening to a front tank section on the other longitudinal side of said main tank, passing said bath through a bottom



opening in said front tank section through a lower compartment in an intermediate tank section to a rear tank section, passing a relatively small amount of said bath from said main tank to an upper compartment in said intermediate tank section through a small opening adjacent the top thereof, passing said bath from said upper compartment to said rear tank section through a small opening adjacent the top thereof, and circulating said bath from said rear tank section rearwardly in said main tank around the rear end of said baffle.

4,138,274

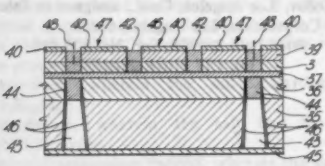
METHOD OF PRODUCING OPTOELECTRONIC DEVICES WITH CONTROL OF LIGHT PROPAGATION BY PROTON BOMBARDMENT

John C. Dyment, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 765,900, Feb. 7, 1977, Pat. No. 4,115,150, which is a division of Ser. No. 694,333, Jun. 9, 1976, Pat. No. 4,080,617. This application Apr. 26, 1978, Ser. No. 900,293

Int. Cl.² H01S *3/00, 3/06, 3/18;* H01L *21/225*

U.S. Cl. 148—1.5 **4 Claims**



1. A method of producing an optoelectronic device, comprising:

etching one surface of a substrate of semiconductor material to produce at least one protrusion extending normal to said surface of said substrate;

forming a first confining layer on said substrate, said layer extending over said protrusion, said layer and said substrate the same conductivity type;

forming an active layer on said first confining layer and a second confining layer on said active layer, said second confining layer being of opposite conductivity type as said first confining layer and said active layer being of the same conductivity type as one of said confining layers;

said protrusion forming a photon absorbing barrier.

4,138,275

METHOD OF MANUFACTURING ALUMINUM ALLOY FOR ELECTRIC CONDUCTOR

Minoru Yokota, Nishinomiya, and Kenichi Sato, ibaraki, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 8, 1977, Ser. No. 822,441

Claims priority, application Japan, Aug. 10, 1976, 51-95578; Aug. 10, 1976, 51-95579; Aug. 10, 1976, 51-95580; Aug. 10, 1976, 51-95581

Int. Cl.² C22F *1/04*

U.S. Cl. 148—2 **8 Claims**

1. A method of manufacturing an aluminum alloy for electric conductors which is characterized by casting an aluminum-iron type alloy consisting of 1.0 ~ 2.0% iron and the remainder substantially of aluminum into an ingot, heating said ingot at 500° ~ 630° C. for 0.5 ~ 48 hours to effect coarsening of precipitates as cast and precipitation of a portion of Fe in solid solution, and then hot-working said ingot into a wire rod.

4,138,276

COATING COMPOSITIONS

Russell C. Miller, Chicago, Ill., assignor to J. M. Eltzroth & Associates, Inc., Schaumburg, Ill.

Division of Ser. No. 662,726, Mar. 1, 1976, Pat. No. 4,088,621, which is a continuation-in-part of Ser. No. 505,212, Sep. 12, 1974, abandoned. This application Oct. 25, 1977, Ser. No. 845,468

The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.

Int. Cl.² C08L *33/04;* B05D *3/10;* B32B *15/20, 15/08*

U.S. Cl. 148—6.2 **18 Claims**

11. A process of protecting metals which comprises coating said metals with a coating composition comprising an emulsion of at least one organic film-forming resin selected from the group consisting of thermoplastic resins, thermosetting resins and mixtures thereof, together with 0.5–20% by weight of said composition of a silicofluoride of calcium, magnesium, strontium or barium and 0–10% by weight of said composition of a hexavalent inorganic chromium compound, calculated as Cr.

4,138,277

METHOD AND APPARATUS FOR PRODUCING METAL BLANKS, IN PARTICULAR STEEL SLABS, WHICH AT LEAST IN A PREDETERMINED SURFACE AREA HAVE SUBSTANTIALLY NO DEFECTS

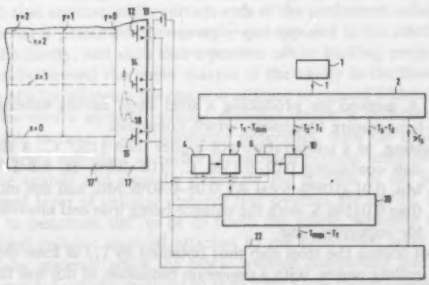
Per-Olle Karlsson, Oxelosund, Sweden, assignor to Granges Oxelosunds Jarnverk AB, Sweden

Filed Apr. 15, 1976, Ser. No. 677,078

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1975, 2558966

Int. Cl.² B23K *7/06*

U.S. Cl. 148—9.5 **17 Claims**



1. Method for producing metal blanks, in particular steel slabs, which at least in a predetermined surface area have

substantially no defects such as cracks, seams, bubbles, scabs or the like, at least the surface portion of the slab to be made free of defects being divided by means of a preferably rectangular coordinate system into coordinate fields and being systematically and substantially completely scanned by means of an inspection means detecting such defects at and closely beneath the surface and dividing them into a plurality of depth classes, and the maximum defect depth or maximum defect depth class determined in each case for a coordinate field being used to control the respective machining depth of a machining means which removes defects by scarfing, grinding, milling, planing and/or another cutting machining and/or local material melt deposition and/or material replacement, characterized in that when using electrical, magnetic and/or magnetic-inductive inspection means, in particular eddy current inspection means, defects which occur within a coordinate field and/or within two adjacent coordinate fields in a defect accumulation exceeding a predetermined defect minimum number are especially marked and/or taken into account with a weight changed with respect to a single defect in the determination of the maximum defect depth or maximum defect depth class.

4,138,278

METHOD FOR PRODUCING A STEEL SHEET HAVING REMARKABLY EXCELLENT TOUGHNESS AT LOW TEMPERATURES

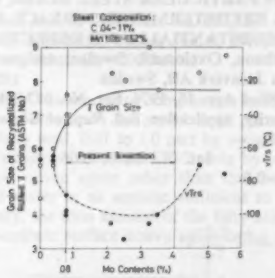
Hajime Nakasugi; Hiroaki Masui; Hiroshi Tamehiro, and Hiroo Mazuda, all of Kimitsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 22, 1977, Ser. No. 826,820

Claims priority, application Japan, Aug. 27, 1976, 51-102239; Apr. 28, 1977, 52-48497

Int. Cl.² C21D 7/14

U.S. Cl. 148—12 R **16 Claims**



1. A method for producing a steel sheet having excellent low-temperature toughness, which comprises

heating, to a temperature not higher than 1150° C., a steel slab containing 0.01–0.13% C, 0.05–0.8% Si, 0.8–1.8% Mn, 0.01–0.08% total Al, 0.08–0.40% Mo, and not more than 0.015% S, with the balance being iron and unavoidable impurities, and

hot rolling the steel slab thus obtained by (1) at least three rolling passes, with a minimum reduction of not less than 2% by each rolling pass, in a temperature range of 900°–1050° C., (2) a total reduction at 900° C. or lower of not less than 50%, and (3) a finishing temperature not higher than 820° C.

4,138,279

METHOD OF PRODUCING STAINLESS STEEL PRODUCT

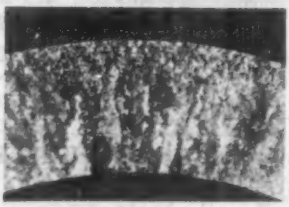
Shinichi Murakami, Osaka; Katsutaro Akamatsu, Hirakata; Arata Yoshimitsu, Katano, and Sueyoshi Noji, Hirakata, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Feb. 28, 1977, Ser. No. 773,120

Claims priority, application Japan, Mar. 1, 1976, 51-22913; Mar. 1, 1976, 51-22914

Int. Cl.² C21D 7/02

U.S. Cl. 148—12 E **2 Claims**



1. A method of manufacturing a stainless steel product which comprises applying plastic cold processing, at a processing degree selectively equal to or larger than 10%, to at least a predetermined portion of a base material of a centrifugal cast steel product of austenite stainless steel containing, at centrifugal casting, 5 to 40% of a ferrite phase, said cast steel product having a configuration close to that of the final product and a coarse cast structure, subsequently applying a recrystallizing treatment to said cast and cold worked steel product for making the cast structure thereof fine, which recrystallizing treatment comprises heating said cast and cold worked steel product up to the solution heat treatment temperature of 1000 to 1250° C. and maintaining the thus heated product at approximately the same temperature to cause recrystallization thereof, and quenching the thus treated cast steel product after recrystallization.

4,138,280

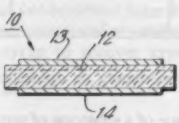
METHOD OF MANUFACTURE OF ZENER DIODES

Vladimir Rodov, Los Angeles, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Feb. 2, 1978, Ser. No. 874,416

Int. Cl.² H01L 21/223

U.S. Cl. 148—186 **10 Claims**



1. The process of manufacture of a zener diode having a predetermined reverse voltage (V) comprising the steps of measuring the resistivity (ρ) of a semiconducting body which is to receive a zener diode junction therein, and diffusing impurity atoms into said body at a constant temperature and for a time (T) where said time (T) is determined from the relation:

$$V = k\sqrt{\rho}\sqrt[4]{T}$$

where k is a constant.

4,138,281
PRODUCTION OF EXPLOSIVE EMULSIONS

Robert S. Olney, Bethlehem, and Charles G. Wade, Lehighton, both of Pa.

Filed Nov. 4, 1977, Ser. No. 848,670
Int. Cl.[2] C06B *45/00*
U.S. Cl. 149—2 12 Claims

1. A process for producing explosive emulsion compositions sensitized with microbubbles comprising:

(a) forming an aqueous inorganic oxidizing salt solution of at least about 64% by weight inorganic oxidizing salts and maintaining said solution above the crystallization temperature thereof;

(b) forming a hydrocarbon fuel component and heating it to approximately the same temperature as said oxidizing solution;

(c) introducing said oxidizer solution, said hydrocarbon fuel component, and an emulsifier to a mixing zone and mixing at conditions sufficient to obtain emulsifying shear rates to thereby form an emulsion matrix, said emulsifier being added in a manner such that the time of contact with the heated oxidizer solution and hydrocarbon fuel component is not sufficient to cause said emulsifier to degrade prior to the formation of said emulsion matrix; and

(d) blending with said emulsion matrix a predetermined quantity of microbubbles delivered from a deaerated supply thereof to form explosive emulsion.

4,138,282
HIGH BURNING RATE PROPELLANTS WITH COPRECIPITATED SALTS OF DECAHYDRODECABORIC ACID

Terrence P. Goddard, Aptos, and Donald N. Thatcher, Hollister, both of Calif., assignors to Teledyne McCormick Selph, Hollister, Calif.

Continuation-in-part of Ser. No. 694,626, Jun. 10, 1976, which is a continuation-in-part of Ser. No. 585,216, Jun. 6, 1975, abandoned. This application Jul. 22, 1976, Ser. No. 707,810
The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.
Int. Cl.[2] C01B *45/10*
U.S. Cl. 149—19.8 53 Claims

1. A propellant composition wherein substantially all the oxidizer is physically intertwined by a coprecipitation with certain simple decahydrodecaborate salts, comprising, by weight:

(A) a polymeric binder system, in the range 8–35 percent;

(B) curing agents, in the range 0–10 percent;

(C) plasticizing agents, in the range 0–25 percent;

(D) the resultant product, in the range 35–90 percent, of a process wherein a solid oxidizing agent is coprecipitated with certain simple decahydrodecaborate salts, having the common anion $B_{10}H_{10}^{-2}$, wherein the cation is selected from the group consisting of:

(a) ammonium, wherein the salt has the formula $(NH_4)_2B_{10}H_{10}$;

(b) hydrazinium, wherein the salt has the formula $(NH_2NH_3)B_{10}H_{10}$;

(c) substituted ammonium cations, wherein the salt has the general formula $(R_3NH)_2B_{10}H_{10}$, wherein further R is selected from the group consisting of hydrogen and alkyl radicals containing less than six carbon atoms;

(d) substituted hydrazinium cations, wherein the salt has the general formula $(R_2NNR_2H)_2B_{10}H_{10}$ wherein further R is selected from the group consisting of hydrogen and alkyl radicals containing less than six carbon atoms, wherein said process comprises the steps of:

(i) dissolving both the decahydrodecaborate (−2) salt and the oxidizing agent in a mutually soluble solvent, at a temperature sufficiently high to maintain said salt and said oxidizing agent in solution;

(ii) forming a pressurized stream of said solution and bringing said solution stream together with a pressurized stream of a miscible nonsolvent, under conditions of extreme turbulence within a mixing chamber, to effect a substantially complete coprecipitation;

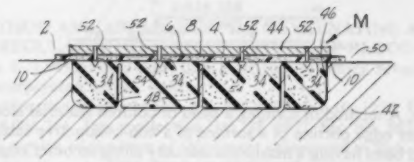
(iii) recovering the coprecipitated product by filtering the effluent from said mixing chamber, and washing said product with an inert and nonsolvent fluid;

(iv) drying the product to remove all remaining liquid.

4,138,283
PROCESS FOR PRODUCING FABRIC-BACKED CUSHIONING MATERIAL

Helmut G. Hanusa, Cape Girardeau, Mo., assignor to Textron Inc., Providence, R.I.

Filed Sep. 1, 1976, Ser. No. 719,414
Int. Cl.[2] B29C *17/02*; B29D *27/04*
U.S. Cl. 156—77 8 Claims



1. A process for producing a cushion for seating, said process comprising: introducing a liquid reaction mixture into a mold cavity having an upwardly presented open end, the liquid reaction mixture being capable of expanding into a cellular material that has a high degree of flexibility so as to have good cushioning properties, the liquid reaction mixture being in sufficient quantity to substantially fill the entire cavity when expanded; attaching a thin composite backing to a rigid cover that is large enough to completely cover the open end of the cavity, the composite backing including a fabric and thin preformed layer of polyurethane cellular material with the fabric and the preformed cellular material being directly against each other and bonded firmly together such that the fabric extends substantially entirely over one major surface area of the preformed layer of cellular material, the preformed cellular material having open cells and being presented away from the cover so that the fabric is against the cover, the composite backing being attached to the cover at a plurality of locations, some of which are located near the margins of the backing and others of which are spaced substantially inwardly from the margins, so that the backing may be suspended from the cover without sagging away from the cover; placing the cover and the composite backing attached to it over the open top of the cavity such that another major surface area of the preformed cellular material is presented downwardly and exposed to the interior of the cavity, and such that a portion of the backing projects laterally beyond the upper margin of the cavity in the formation of a lip; allowing the reaction mixture to expand within the cavity into a molded cellular material which is sufficiently flexible to have good cushioning properties, with the expansion being sufficient to enable the molded cellular material to come against and partially penetrate the portion of the preformed layer of cellular material that overlies the cavity, but not to penetrate the lip or to reach the fabric, whereby the molded cellular material attaches to the preformed layer of cellular material while the fabric remains completely free of the molded cellular material so as to form a low friction surface across the back of the cushion; and venting the cavity through the open cells of the preformed cellular material as the reaction mixture expands in the cavity.

said oxygenating chamber for forming blood foam within said chamber; and

second means for both (a) oxygenating the blood flowing in said blood circuit by transferring oxygen into the blood and removing carbon dioxide from the blood and (b) simultaneously regulating the temperature of said blood, said second means comprising a heat transfer fluid conduit including heat exchange fluid inlet and outlet means and having rib means along its length, said rib means being located in contact with or closely proximate to the inner wall of said oxygenating chamber so that substantially all of said blood and blood foam produced by said first means flows in contact with external surfaces of said heat transfer fluid conduit through a plurality of restricted area, extended length flow paths around the exterior of the heat transfer fluid conduit provided by said rib means in combination with said inner wall prior to any substantial defoaming of the blood foam and with minimal areas of stagnation for said blood and blood foam with a resulting relatively long residence time po the bloodand blood foam in contact with said heat transfer fluid conduit.

4,138,289

PROCESS FOR THE MANUFACTURE OF TERTIARY, OPTICALLY ACTIVE ALIPHATIC COMPOUNDS

Richard Barner, Witterswil; Walter Boguth, Riehen; Hans G. W. Leuenberger, Arlesheim; Max Schmid, Zurich, and Reinhard Zell, Rodersdorf, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

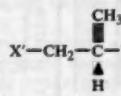
Filed May 2, 1977, Ser. No. 793,093

Claims priority, application Austria, May 10, 1976, 3407/76; Switzerland, Feb. 18, 1977, 2064/77

Int. Cl.² C12D *13/02*

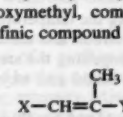
U.S. Cl. 195—30 **24 Claims**

1. A process for producing a tertiary optically active aliphatic compound of the formula



II

wherein X′ and Y′ are different functional groups, one is carboxy, esterified carboxy and the other is carboxy, hydroxymethyl, esterified carboxy or etherified or esterified hydroxymethyl; wherein the carboxy and hydroxymethyl groups are lactonized with one another with the formation of the group —CO—O—CH_2— or —CH_2—O—CO—, and wherein when X′ is alkyl-etherified hydroxymethyl, Y′ is also hydroxymethyl or esterified hydroxymethyl, comprising fermentatively hydrogenating an olefinic compound of the formula:



I

wherein X is carboxy, esterified carboxy, hydroxymethyl etherified or esterified hydroxymethyl and Y is carboxy, formyl, hydroxymethyl, esterified carboxy, acetalized formyl or etherified or esterified hydroxymethyl; wherein X and Y are different functional groups; wherein when X is hydroxymethyl or esterified hydroxymethyl, Y is carboxy, formyl, or acetalized formyl and when Y is hydroxymethyl or esterified hydroxymethyl, X is esterified carboxy or alkyl-etherified hydroxymethyl, with an aerobic or facultative microorganism capable of hydrogenating a double bond situated in an aliphatic chain between a CH and methylated CH moiety in an aqueous medium to obtain said tertiary optically active aliphatic compound as a fermentation product.

4,138,290

GLUCOSE ISOMERIZATION UNDER EXPANDED BED CONDITIONS

William H. McMullen, Norwalk, Conn., and William Carasik, Ridgewood, N.J., assignors to Novo Laboratories, Incorporated, Wilton, Conn.

Filed Apr. 22, 1976, Ser. No. 679,445

Int. Cl.² C12D *13/02*

U.S. Cl. 195—31 F **5 Claims**

1. A process utilizing expanded bed isomerization to convert glucose syrup to a glucose-fructose mixture containing at least 40% fructose by weight of the glucose-fructose content which comprises passing a 30–55% w/w of glucose syrup at isomerizing temperature and pH conditions up through at least one bed of a cell mass particulate form glucose isomerase preparation having uniform size in the range of 150–2,500 micrometers at a superficial linear velocity for the syrup of 0.5–15 meters an hour, said velocity and particle size being related in an inverse relation to create a bed expansion within the range of 5–100% and plug flow by the syrup through the bed, the bed depth being sufficient to achieve the aforementioned at least 40% fructose content.

4,138,291

MICROBIOLOGICAL METHODS

Robert M. Lafferty, Graz, Austria, assignor to Agroferm AG, Chur, Switzerland

Filed Aug. 8, 1977, Ser. No. 822,756

Claims priority, application Switzerland, Aug. 6, 1976, 10104/76

Int. Cl.² C12D *1/02*

U.S. Cl. 195—47 **26 Claims**

1. A method of obtaining selected bacterial strains which, under any growth conditions, can substantially convert an assimilable carbon source selected from carbohydrates, methanol, ethanol, glycerin, carbon dioxide and spent lyes from caprolactam synthesis containing monocarboxylic and dicarboxylic acids into poly-(D-3-hydroxybutyric acid) which method comprises selecting from poly-(D-3-hydroxybutyric acid)- producing bacterial strains those which form colonies of milky-white appearance on an agar nutrient medium, said colonies having dome-shaped elevations above the agar surface or attaining large dimensions; breeding said selected bacterial strains on constantly increasing concentrations of said assimilable carbon source; and subjecting said bacterial strains at least once to the action of mutagenic agents whereby the desired bacterial strains are obtained.

8. A method as claimed in claim 1, wherein said bacterial strains are subjected at least once before selection to the action of said mutagenic agents.

4,138,292

IMMOBILIZED CATALYTICALLY ACTIVE SUBSTANCE AND METHOD OF PREPARING THE SAME

Ichiro Chibata, Suita; Tetsuya Tosa, Kyoto, and Isao Takata, Takatsuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jun. 16, 1977, Ser. No. 807,259

Claims priority, application Japan, Jul. 2, 1976, 51-79346

Int. Cl.² C07G *7/02*; C12B *1/00*

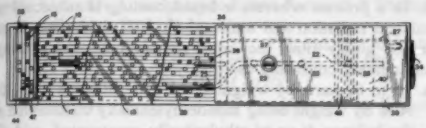
U.S. Cl. 195—59 **64 Claims**

1. An immobilized catalytically active substance which comprises a catalytically active enzyme or microorganism or a water-insoluble, hydrophilic, catalytically active carrier-bound enzyme or microorganism entrapped within the gel matrix of a sulfated polysaccharide (sulfate moiety content in the molecule: more than 10 w/w %) containing therein ammonium ion, a metal ion having an atomic weight greater than 24, a water-soluble organic amine or a water-miscible organic solvent.

4,138,293
DESALINATION APPARATUS

Kurt F. Ziehm, Jr., P.O. Box 13, Land O'Lakes, Wis. 54540

Division of Ser. No. 627,964, Nov. 3, 1975, Pat. No. 4,077,849.
This application Jan. 27, 1978, Ser. No. 872,815
Int. Cl.[2] B01D *1/00, 3/00*
U.S. Cl. 202—180 6 Claims



1. Solar desalination apparatus comprising a heating chamber having a light permeable glass in its upper side, means to convey at least one solar heatable, endless metal belt through said chamber beneath said glass to subject said belt to solar radiation in said chamber and thereby heat said belt, a vaporizing chamber adjacent said heating chamber, means for passing the heated belt through said vaporizing chamber, means for applying saline water onto said heated belt in said vaporizing chamber to vaporize the water applied thereon, and condensing means to condense the essentially salt-free vapors so produced.

4,138,294
ACID ZINC ELECTROPLATING PROCESS AND COMPOSITION

Donald A. Arcilesi, Mount Clemens, Mich., assignor to M&T Chemicals Inc., Stamford, Conn.

Filed Dec. 6, 1977, Ser. No. 857,881
Int. Cl.[2] C25D *3/22*
U.S. Cl. 204—55 R 38 Claims

20. An aqueous acidic plating solution containing at least one zinc compound providing zinc cations for electroplating zinc, and containing as cooperating additives at least one bath soluble substituted or unsubstituted polyether, 0.01 to 10 g/l of at least one aliphatic unsaturated acid containing an aromatic or heteroaromatic group of the structure

$$R - C(=O) = CHCOH$$

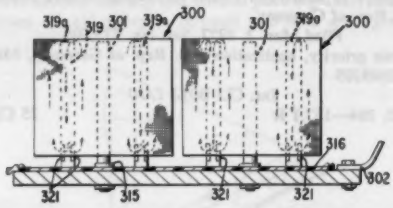
where R is an aromatic or heteroaromatic moiety and 0.01 to 500 mg/l of at least one aromatic nitrogen heterocyclic compound such that said acids and said nitrogen heterocyclic compounds are not the same.

4,138,295
PROCESS AND APPARATUS FOR DOWNWARD RECYCLING OF THE ELECTROLYTE IN DIAPHRAGM CELLS

Vittorio DeNora, Nassau, The Bahamas, and Oronzio de Nora, Milan, Italy, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Continuation of Ser. No. 754,024, Dec. 23, 1976, abandoned.
This application Feb. 17, 1978, Ser. No. 878,750
Int. Cl.[2] C25B *1/16, 1/26, 11/02;* C55B *11/03*
U.S. Cl. 204—98 37 Claims

1. In the process of producing chlorine by electrolyzing aqueous alkali metal chloride solution in an electrolytic cell between a hollow anode located between a pair of cathode surfaces and open at its top and lower ends, the improvement which comprises generating between said cathode surfaces and said anode, during said electrolysis, upward circulation of solution toward the top of the solution in both the hollow interior of the anode and in the spaces between the exterior of

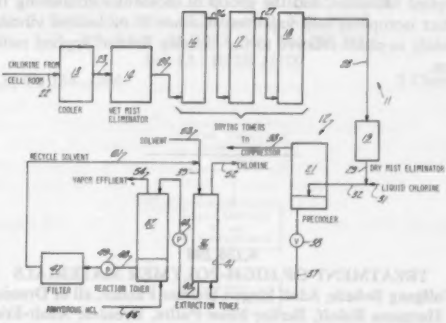


the anode and the adjacent cathode surfaces, and downward movement of the solution from an upper level of said solution to a lower level thereof through electrically non-conducting passages substantially free of gaseous halogen within said hollow anode.

4,138,296
METHOD FOR REMOVING NITROGEN TRICHLORIDE FROM CHLORINE GAS

Edward N. Balko, Trenton, and Shyam D. Argade, Woodhaven, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jun. 3, 1977, Ser. No. 803,133
Int. Cl.[2] C25B *1/26;* B01D *53/34*
U.S. Cl. 204—128 15 Claims



1. In a method of electrolytically producing gaseous chlorine from a brine and subsequent recovery of chlorine, in which method nitrogen trichloride is produced as a contaminant in said chlorine, the improvement comprising the steps of

condensing a portion of said chlorine and substantially all of the contaminants boiling at a temperature higher than chlorine to provide a condensate of some of said chlorine and substantially all of the higher boiling contaminants including nitrogen trichloride,

mixing said condensate with an inert organic solvent for said nitrogen trichloride to form a solution thereof,

distilling off substantially all of the chlorine from the solution,

adding a reducing agent to said solution in an amount sufficient to convert the nitrogen trichloride to ammonium chloride,

separating the organic solvent from the reaction mixture, and

recycling the organic solvent to treat further condensate.

4,138,297

METHOD FOR ISOTOPE SEPARATION BY MEANS OF COHERENT ELECTROMAGNETIC RADIATION

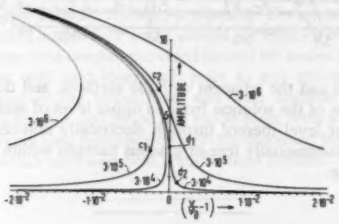
Karl Janner, Erlangen; Klaus Gregorius, Neunkirchen, and Heinz Stehle, Marloffstein, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,505

Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2609205

Int. Cl.[2] B01J 1/10

U.S. Cl. 204—157.1 R 25 Claims



1. In a method for the separation or enrichment of isotopes in a vaporous mixture of molecules containing the isotopes to selectively excite the group of molecules containing one isotope by means of coherent, polarized electromagnetic radiation, the improvement comprising applying said radiation to said vaporous mixture of molecules, with a frequency and field strength such that the dipole moment of the group of molecules to be excited vibrates, at least at the final amplitude, mainly in phase opposition relative to the exciting field of applied radiation, and the group of molecules containing the other isotope in said vaporous mixture of molecules vibrates mainly in-phase relative to the exciting field of applied radiation.

4,138,298

TREATMENT OF HIGH-POLYMER MATERIALS

Wolfgang Bobeth; Adolf Heger; Helmar Passler, all of Dresden; Hermann Roloff, Berlin; Ellen Patitz, Dresden; Adolf-Ernst Schwind, Deutsch-Musterhausen, and Erwin Zilinski, Berlin, all of German Democratic Rep., assignors to Forschungs Institut fur Textiltechnologie, Karl-Marx-Stadt, German Democratic Rep.

Continuation-in-part of Ser. No. 141,167, May 7, 1971, abandoned. This application May 24, 1974, Ser. No. 473,303

Int. Cl.[2] C08J 7/18, 7/10

U.S. Cl. 204—159.12 15 Claims

1. A method of producing textured effects in a high-polymer textile or fabric material or varying the intensity of said beam in said selected areas so as to cause the formation of chemically active species in selected areas only of said material while other areas remain substantially unirradiated or exposed to radiation of a critically lower intensity, contacting said textile or fabric material with a treating medium which is capable of causing shrinkage or increased shrinkage by reaction with or action on said chemically active species in said selected irradiated areas whereby a differential shrinkage is obtained between said radiated and non-radiated areas resulting in a textured effect, the said treating medium being hot air, hot water, saturated steam or a monomeric polymerizable substance.

4,138,299

PROCESS UTILIZING A PHOTOPOLYMERIZABLE AND MOISTURE CURABLE COATING CONTAINING PARTIALLY CAPPED ISOCYANATE PREPOLYMERS AND ACRYLATE MONOMERS

Nicholas C. Bolgiano, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 23, 1977, Ser. No. 863,844

Int. Cl.[2] C08F 8/00; C08G 18/00

U.S. Cl. 204—159.16 8 Claims

1. In a process wherein a liquid coating is subjected to a combined radiation and moisture cure to yield a tough mar-resistant glossy film, the improvement comprising using a liquid coating consisting essentially of:

a. 15 to 60 parts by weight of acrylate diluents with 10 to 90% by weight being monoethylenically unsaturated and the balance di or tri-ethylenically unsaturated, said diluents have no reactive hydroxyl groups; and

b. 40 to 85 parts by weight —NCO terminated prepolymers prepared by reacting a mixture of 20 to 80% by weight polyester diol and 20 to 80% by weight polyester triol with an excess of an aliphatic diisocyanate, said prepolymer mixture being further reacted with sufficient hdyroxy acrylate to cap 5 to 15% of the available —NCO groups.

4,138,300

PROCESS FOR PRODUCING A TRANSPARENT SHAPED POLYMERIC PRODUCT

Isao Kaetsu; Hiroshi Okubo, and Fumio Yoshii, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Mar. 24, 1976, Ser. No. 670,170

Claims priority, application Japan, Mar. 26, 1975, 50-35375

Int. Cl.[2] C08F 2/54, 220/14

U.S. Cl. 204—159.22 13 Claims

1. A process for efficiently producing a transparent shaped polymeric product free from defects such as bubbles and strain, of sufficiently high physical properties, such as surface hardness, weather resistance and impact resistance, to serve as a substitute for inorganic glass, consisting essentially of the steps of: mixing

(A) methyl methacrylate or its prepolymer,

(B) a monomer represented by the formula

$$CH_2=CX-\underset{\underset{O}{\|}}{C}-OR$$

or

$$CH_2=CX-\underset{\underset{O}{\|}}{C}-O-(CH_2)_nOH$$

wherein X is H or CH_3, R is alkyl having 2–6 carbon atoms and n is an integer of from 3 to 7, a mixture of the monomers or a prepolymer thereof, and

(C) a monomer represented by the formula

$$CH_2=CX-\underset{\underset{O}{\|}}{C}-O-CH_2-\underset{\underset{O}{\diagdown\diagup}}{CH}-CH_2$$

or

$$CH_2=CX-\underset{\underset{O}{\|}}{C}-O-(CH_2CH_2O)_m-\underset{\underset{O}{\|}}{C}-CX=CH_2$$

wherein X is H or CH_3 and m is an integer of from 2 to 4, a mixture of the monomers, or a prepolymer thereof, the amount each of the components (A), (B) and (C) ranging from 20 to 50% by weight and the total amount of the components being 100% by weight;

pouring the resulting mixture into a cell or mold for cast polymerization; and

irradiating said mixture with light or ionizing radiation at a temperature below room temperature to polymerize said mixture.

4,138,301

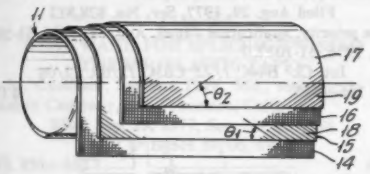
FISHING ROD FERRULE

Richard VanAuken, Bridgewater, and Albert T. Mills, Jr., Somerville, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 604,178, Aug. 13, 1975, Pat. No. 4,083,140. This application Apr. 13, 1977, Ser. No. 787,050

Int. Cl.² B65H *81/00*

U.S. Cl. 156—189 **5 Claims**



1. The method of forming a fiber-reinforced plastic ferrule for a multisectional fishing rod comprising the steps of:

cutting a sheet of glass cloth to a predetermined flat pattern to provide a first layer having the fibers oriented therein at angles of 0° and 90° with respect to the major axis of said flat pattern;

cutting a sheet of resin impregnated unidirectional graphite fibers to the same predetermined flat pattern to provide a second layer having fibers oriented at an angle ranging from about 55° to about 70° with respect to the major axis of the predetermined flat pattern;

cutting a sheet of glass cloth to the same predetermined pattern to provide a third layer having the same fiber orientation as the first layer;

cutting a resin impregnated unidirectional sheet material to the same predetermined flat pattern to provide a fourth layer having the fibers oriented at an angle ranging from about −55° to about −70° with respect to the major axis of the predetermined flat pattern;

arranging said glass cloth and graphite fiber layers in alternating fashion thereby forming a laminated material;

wrapping said laminated material around a tapered mandrel;

heating said assembly of wrapped laminated material and mandrel to a temperature sufficient to cause the resin of the layers to fuse; and

thereafter allowing the fused material to cool and removing the mandrel.

4,138,302

METHOD OF MAKING A STUBLESS MULTI-PLY ASSEMBLY

Emil A. D'Luhy, Youngstown, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

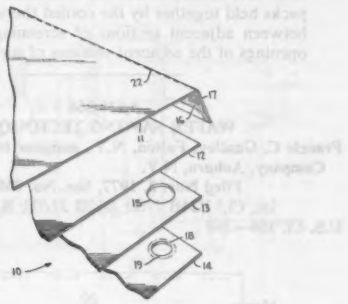
Continuation of Ser. No. 623,393, Oct. 17, 1975, Pat. No. 4,039,046. This application Jun. 22, 1977, Ser. No. 809,056

The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.

Int. Cl.² B31F *1/00*

U.S. Cl. 156—216 **4 Claims**

1. A method of making a stubless unit set of multiple plies of the type which includes superimposed top, intermediate and bottom plies, comprising, providing a fold flap along one edge of said top ply, applying a line of weakening extending along the fold between said flap and said top ply to thereby render said flap removably connected to said top ply, applying a quantity of detachable adhesive to one surface of said flap, providing at least one hole in only said bottom ply along an edge thereof underlying said one edge, folding said flap along said line of weakening and about a edge of said intermediate ply underlying said one edge and further about said edge of said bottom ply, bringing said one surface of said flap into contact with an undersurface of said bottom ply so that said adhesive secures said top and bottom plies together, extending a portion of said adhesive through said hole and against an



undersurface of said intermediate ply to thereby interconnect said intermediate and bottom plies together, and maintaining each of said plies free of any tear lines which may form a stub, whereby removal of said top ply along said line of weakening leaves said intermediate and bottom plies intact, or removal of said intermediate ply leaves said top and bottom plies interconnected, or removal of said top and intermediate plies separates each of said plies from one another.

4,138,303

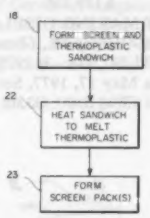
METHOD OF FORMING SCREEN PACKS

John J. Taylor, Sr., Box 43, Hopewell, N.J. 08525

Filed Apr. 21, 1977, Ser. No. 789,761

Int. Cl.² B32B *31/00*

U.S. Cl. 156—264 **7 Claims**



1. A method of simultaneously forming a plurality of flat screen packs for use in filtering out foreign matter from an extruded plastic material, each screen pack including a plurality of flat, parallel-extending, metal screens, the method comprising the steps of:

(a) forming a flat sandwich array comprising a plurality of flat sheets of metallic screening, each sheet of screening having a predetermined orientation with respect to each other sheet of screening, with each flat sheet of screening being separated from each adjacent, flat sheet of screening by a flat, continuous sheet of a thermoplastic material, said thermoplastic material being compatible with an extruded plastic material which is to be subjected to filtration through the plurality of flat screen packs such that, upon the directing of the extruded plastic material, in molten condition, at each screen pack, the thermoplastic material will be heated and forced out through the openings in the screen pack screens by the molten, extruded plastic material;

(b) heating the entire sandwich array; while also

(c) applying a pressure differential across the sandwich array

sufficient to cause the heated thermoplastic material to flow into the opening in the sheets of screening;

(d) terminating the heating while maintaining the sandwich array such that the sandwich array becomes a unitary structure of sheets of screening bound together by the flowed thermoplastic material upon cooling of the thermoplastic material; and

(e) forming a plurality of flat screen packs simultaneously from said unitary structure, with each of the flat screen packs held together by the cooled thermoplastic material between adjacent sections of screening and within the openings of the adjacent sections of screening.

4,138,304

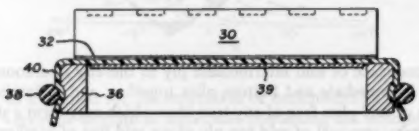
WAFER SAWING TECHNIQUE

Francis C. Gantley, Fulton, N.Y., assignor to General Electric Company, Auburn, N.Y.

Filed Nov. 3, 1977, Ser. No. 848,129

Int. Cl.² B24B *1/00*; B32B *31/00*; B28D *1/04*

U.S. Cl. 156—268 **20 Claims**



1. A method for dividing a semiconductor wafer into pellets comprising:

providing a flexible membrane;

coating a surface of said wafer with a layer of coupling material which adheres more tenaciously to said membrane than to said wafer;

bonding said wafer to said membrane; and

dividing said wafer into pellets by sawing completely through said wafer and at least partially through said layer.

4,138,305

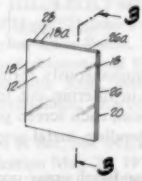
METHOD OF MAKING DISPLAY DEVICE

Cole C. Williams, 2408 Allanjay Pl., Glendale, Calif. 91208

Division of Ser. No. 637,297, Dec. 3, 1975, Pat. No. 4,044,483. This application May 17, 1977, Ser. No. 797,879

Int. Cl.² C09J *5/00*; B32B *17/00*

U.S. Cl. 156—305 **5 Claims**



1. A method of hingeably interconnecting planar members, each characterized by having opposing front and back faces and at least one substantially straight side interconnecting said faces, said method comprising the steps of:

(a) cleaning the planar members to remove surface contaminants therefrom;

(b) securely clamping the planar members together with the faces thereof in engagement and the straight sides thereof aligned and disposed in a coplanar relationship, said straight sides of said planar members being disposed within planes substantially perpendicular to the faces of said members; and

(c) uniformly depositing an integral bead of a room temperature vulcanizing silicone rubber along substantially the entire length of said straight side portions of said planar members so that said bead overlaps the juncture between said planar members, said silicone rubber being deposited on said straight side portions of said planar members in the form of a bead which is generally semicircular in cross section at any point, said bonding material being deformable whereby when said members are moved into a position wherein said faces are substantially coplanar said bead will be disposed intermediate said straight side portions.

4,138,306

APPARATUS FOR THE TREATMENT OF SEMICONDUCTORS

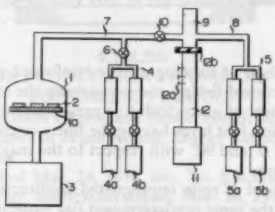
Kazuo Niwa, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 29, 1977, Ser. No. 828,812

Claims priority, application Japan, Aug. 31, 1976, 51-103236; Aug. 31, 1976, 51-103237

Int. Cl.² B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—345 **8 Claims**



1. Apparatus for the treatment of semiconductors comprising a reaction chamber for effecting the vapor phase reaction of semiconductor substrates, means for introducing a vapor phase reaction gas into said reaction chamber, a plasma generating section, means for introducing into said plasma generating section a gas suitable for the plasma treatment of the inside of said reaction chamber, power applying means for activating the gas contained in said plasma generating section, conduit means for introducing the activated gas into said reaction chamber, and evacuation means.

4,138,307

AXIALLY ADJUSTABLE FIRE CONSTRUCTION DRUM

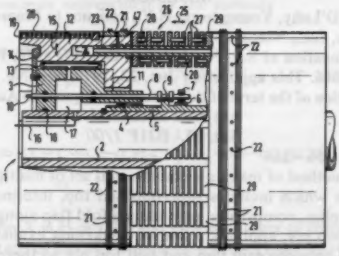
Harry Rost, Munich, Fed. Rep. of Germany, assignor to Metzeler Kautschuk AG, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 815,196

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630893

Int. Cl.² B29H *17/14*

U.S. Cl. 156—415 **11 Claims**



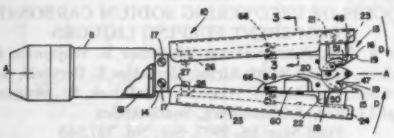
1. An axially and radially adjustable construction drum for pneumatic tires in which the drum has variable width and is

radially extensible and comprises two basic members the relative distance between which is adjustable on an internal tube through a spindle and a screwthreaded sleeve with screwthread portions of opposite direction, in which the basic members support ring segments whose external surfaces form approximately cylindrical working surfaces and which are radially adjustable through bellows and on which is situated a resilient bandage with inflatable members disposed therebelow for holding over the edges of plies and between which is retained a middle part which is radially extensible in the longitudinal direction of the drum, characterized in that a middle part is comprised of plate segments which are resilient in the longitudinal direction of the drum, are slidably retained guide means which interconnect segments of basic members with plates that bridge the distances between the segments by means of interposed spring cartridges.

4,138,308
HEAT WAND FOR SPLICING TWISTED THERMOPLASTIC TAPES

Lloyd M. Guenther, Severna Park, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 29, 1977, Ser. No. 837,788
Int. Cl.² B65H 69/06, 69/08
U.S. Cl. 156—433 **4 Claims**



1. A wand for heat splicing at least two twisted thermoplastic tape, film or thread means together each having an axis of symmetry, comprising:

a housing carrying holding and positioning means and circuit means therein,

said holding and positioning means including clamping means for clamping said tape, film or thread means over common lengths thereof at a series of initial locations so as to prevent rotation of said tape, film or thread means about said axes of symmetry, but to allow rectilinear movement therebetween, and rotatable means for rotating said tape, film or thread means in relative directions opposite to a common twist direction of said tape, film or thread means to a series of final positions in which said tape, film or thread means are each untwisted over a substantial portion of said common lengths thereof while being simultaneously oriented into lapped, cross-aligned heat-receivable positions relative to each other,

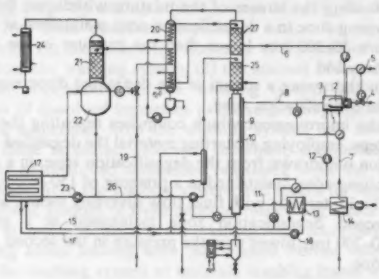
said circuit means including switch means activated by movement of said holding and positioning means relative to said housing to apply heat over a diagonal bias of said lapped, cross-aligned, heat-receivable positions of said tape, film or thread means whereby said at least two tape, film or thread means are heat spliced together.

4,138,309
MULTI-STAGE APPARATUS FOR CONCENTRATING SULPHURIC ACID

Hans L. Kühnlein, Fuellinsdorf, Switzerland, and Wolfgang-Dieter Müller, Leverkusen, Fed. Rep. of Germany, assignors to Hch. Bertrams Aktiengesellschaft, Basel, Switzerland and Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 31, 1977, Ser. No. 802,102
Claims priority, application Switzerland, Jun. 18, 1976, 7807/76
Int. Cl.² B01D 1/22
U.S. Cl. 159—13 A **5 Claims**

1. A multi-stage heat-operated apparatus comprising at least one high temperature stage and one low temperature stage, the high temperature stage including a surrounding wall defining a flue gas channel, means for delivering hot flue gas to said channel, and means for withdrawing from said channel cooled flue gas, the flue gas heating said surrounding wall which in turn imparts heat to material to be heated thereby in the high temperature stage, the high temperature stage including a first heat exchanger for transferring heat from the cooled flue gas to a heating agent, a second heat exchanger for transferring heat

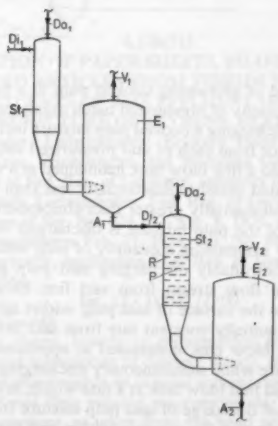


from the heating agent to the low temperature stage, the first and second heat exchangers forming a closed loop through which the heating agent is cycled, the heating agent picking up heat in the first exchanger and giving up heat in the second exchanger, means for withdrawing from said first heat exchanger spent flue gas, and means for delivering material heated in said second heat exchanger to said high temperature stage so as to be operated upon therein.

4,138,310
CONTINUOUS PROCESS FOR THE REMOVAL OF RESIDUAL MONOMER FROM AQUEOUS DISPERSIONS OF HOMO- AND COPOLYMERS OF VINYL CHLORIDE

Josef Kalka, Herten, and Jürgen Beckmann, Oer-Erkenschwick, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed May 14, 1976, Ser. No. 686,328
Claims priority, application Fed. Rep. of Germany, May 14, 1975, 2521401
Int. Cl.² B01D 1/14
U.S. Cl. 159—47 R **6 Claims**



1. In a process for the removal of residual monomer from aqueous dispersions of homo- and copolymers of vinyl chloride having a surface tension of below 60 dyn/cm. by a steam

treatment in which foaming is avoided by rapid lowering of pressure at high flow velocity and which comprises the steps of

(a) mixing a stream of the monomer-containing dispersion with steam in an elongate mixing zone maintained at a pressure of 150–600 torr at a rate such that the flow velocity of the mixture in the mixing zone is 1–20 m./sec.,

(b) withdrawing a stream of the mixture from the mixing zone at a velocity of 30–100 m./sec. from the mixing zone,

(c) feeding the stream of the mixture withdrawn from the mixing zone to a degasification zone maintained at a pressure 30–200 torr lower than the pressure in the mixing zone, and

(d) withdrawing a stream of the degasified dispersion from the degasification zone,

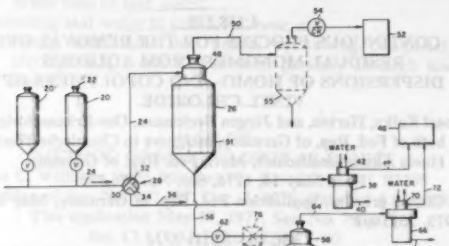
(e) the improvement which comprises repeating the above steps, employing as starting material the degasified dispersion withdrawn from the degasification zone, in a second mixing zone maintained at a pressure of 150–600 torr and fitted internally with fluid flow diverting means, and in a second degasification zone maintained at a pressure 30–200 torr lower than the pressure in the second mixing zone.

4,138,311

METHOD AND APPARATUS FOR BATCH PRODUCTION OF PULP INCLUDING IMPROVED ENERGY RECLAMATION

Gervais S. Neno, Mobile, Ala., assignor to International Paper Company, New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,574
Int. Cl.[2] D21C *7/08*
U.S. Cl. 162—28 **8 Claims**



1. A method of processing cooked pulp in a batch system including a plurality of pressurized batch digesters comprising the steps of discharging a cooked pulp mixture including fibers and black liquor from each of said pressurized batch digesters sequentially into a first blow tank maintained at a substantially constant elevated pressure substantially less than that of said digester and substantially greater than atmospheric until substantially all of the pulp mixture is discharged from said digester thereby maintaining a quantity of pulp within said first blow tank, controllably discharging said pulp mixture in a noninterrupted flow stream from said first blow tank at a location below the surface of said pulp within said first blow tank at a substantially constant rate from said first blow tank into a second blow tank maintained at approximately atmospheric pressure while simultaneously discharging pressurized steam from said first blow tank at a rate which, in combination with the rate of discharge of said pulp mixture from said first blow tank, maintains the pressure within said first blow tank relatively constant and substantially greater than atmospheric pressure and, refining said pulp at a location intermediate said first and second blow tanks.

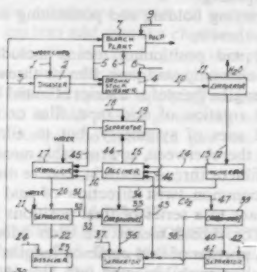
4. An apparatus for producing wood pulp and recovering steam and other vapors including a plurality of batch digesters, each including means defining a bottom outlet thereof, a pressurized first blow tank including means defining an inlet therein, means defining a top outlet therefrom and means defining a bottom outlet therefrom, means maintaining the internal pressure of said first blow tank at a pressure substantially greater than atmospheric pressure through regulation of the discharge of steam and pulp from said pressurized pulp blow tank while maintaining a quantity of pulp within said first blow tank and while maintaining the flow of pulp from said pressurized blow tank continuous and noninterrupted, said means maintaining said internal pressure of said first blow tank including valve means associated with said means defining a top outlet from said first blow tank and valve means associated with said means defining a bottom outlet from said first blow tank, a first blow line connecting said bottom outlet of each of said digesters to said first blow tank inlet, a second blow tank at atmospheric pressure including means defining an inlet therein, means defining a top outlet therefrom and means defining a bottom outlet therefrom, a second blow line connecting said first blow tank bottom outlet and said second blow tank inlet and, refiner means interposed in said second blow line.

4,138,312

PROCESS OF RECOVERING SODIUM CARBONATE FROM SPENT PULPING LIQUORS

Ronald A. Gill, Johannesburg; Waldemar S. Wojtowicz, Krugersdorp, both of South Africa; Cornelius E. Berthold, Littleton, Colo., and Cecil M. Wheeler, Oak Brook, Ill., assignors to Sappi Limited, Johannesburg, South Africa

Filed May 16, 1977, Ser. No. 797,563
Claims priority, application South Africa, May 19, 1976, 76/2995
Int. Cl.[2] D21C *11/04*
U.S. Cl. 162—30 R **9 Claims**



1. A process for the manufacture of cellulose pulp by means of a soda process in which spent liquors are concentrated by evaporation and the concentrated liquors are incinerated in a fluidized bed incinerator to produce a granular sodium carbonate incinerator product contaminated by chlorides, sulphates and potassium compounds, the incinerator product being dissolved in water and causticized in known manner to form white liquor comprising essentially sodium hydroxide, which white liquor is re-used in the said soda process to provide a closed system, the improvement comprising:

treating the incinerator product with water to form a slurry,

agitating the slurry so as to dissolve incinerator product with its contaminants and at the same time crystallize substantially pure sodium carbonate monohydrate leaving a major proportion of the contaminants in solution, separating the substantially pure sodium carbonate from the liquor containing the contaminants, and washing the separated sodium carbonate with water;

converting sodium carbonate remaining with the contaminants in solution to sodium bicarbonate by carbonation with carbon dioxide, separating the precipitate so formed from the mother liquor, and converting the precipitate thus recovered to substantially pure sodium carbonate;

utilizing sodium carbonate recovered in the formation of white liquor; and

discharging the contaminant bearing mother liquor from the system.

4,138,313

METHOD AND APPARATUS FOR CONTINUOUSLY WASHING FIBROUS SUSPENSIONS AND CONTROLLING THE VOLUME OF WASH LIQUID

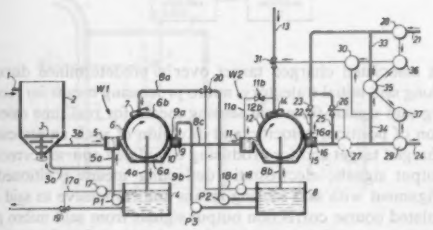
Per A. R. Hillstrom, Domsjo, and Lars G. Norehall, Ornskoldsvik, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Apr. 7, 1977, Ser. No. 785,399

Claims priority, application Sweden, Apr. 14, 1976, 7604431

Int. Cl.² D21C *9/02*

U.S. Cl. 162—49 **8 Claims**



1. A process for continuously washing fibrous suspensions in aqueous suspending liquors containing dissolved impurities, to remove said impurities by exchanging aqueous suspending washing liquid substantially free from said impurities for the aqueous suspending liquor containing impurities, controlling washing losses that are obtained in the continuous washing of the fibrous suspensions due to the dissolved impurities remaining with the washed fibrous suspensions, which comprises in a continuous flow-washing system having at least one washing stage washing fibrous material of the suspension with the aqueous suspending washing liquid substantially free from dissolved impurities, and forming a washed fibrous suspension in said washing liquid, separating from the washed fibrous suspension and withdrawing from the washing stage and recirculating back to the washing stage aqueous suspending liquor containing dissolved impurities washed out from the fibrous suspension; diluting the washed fibrous suspension from the washing stage by adding aqueous suspending liquid capable of dissolving impurities; measuring (1) the volumetric flow rate of the washed suspension from the washing system, (2) the liquid content of the washed suspension from the washing system, and (3) the amount of dissolved impurities in the suspending liquid of the washed suspension from the washing system; and using these measured values to determine continuously the amount of dissolved impurities remaining with the fibrous suspension from the washing system after the washing has been completed; and then controlling the volume amount of wash liquid added to the fibrous suspension in the washing system according to the washing losses leaving with the washed fibrous suspension from the washing system, to maintain washing losses within a predetermined limiting range.

8. Apparatus for continuously washing fibrous suspensions in aqueous suspending liquors containing dissolved impurities, to remove said impurities by exchanging aqueous suspending washing liquid substantially free from said impurities for the aqueous suspending liquor containing impurities, controlling the washing losses that are obtained in the continuous washing of the fibrous suspensions due to the dissolved impurities remaining with the washed fibrous suspensions which comprises in a continuous flow-washing system having at least one washing stage means for washing fibrous material of the suspension with the aqueous suspending washing liquid substantially free from dissolved impurities, and forming a washed fibrous suspension in said washing liquid; means for separating and withdrawing from the washing stage and means for recirculating back to the washing stage aqueous suspending liquor containing dissolved impurities washed out from the fibrous suspension; means for diluting the washed fibrous suspension from the washing stage by adding aqueous suspending liquid substantially free from dissolved impurities; means for separately measuring (1) the volumetric flow rate of the washed suspension from the washing system; (2) the amount of liquid in the washed suspension from the washing system; and (3) the amount of dissolved impurities in the suspending liquid of the washed suspension from the washing system; and means for using these measured values to determine continuously the amount of dissolved impurities remaining with the fibrous suspension from the washing system; and means for supplying the volume amount of fresh aqueous suspending liquor added to the fibrous suspension in the washing stage according to the washing losses leaving with the washed fibrous suspension from the washing system to maintain washing losses within a predetermined limiting range.

4,138,314

METHOD OF FORMING DIAPHRAGMS FROM DISCRETE THERMOPLASTIC FIBERS REQUIRING NO BONDING OR CEMENTING

Arvind S. Patil, Grosse Ile, and Eugene Y. Weissman, Birmingham, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 566,911, Apr. 10, 1975, Pat. No. 4,036,729. This application Jul. 5, 1977, Ser. No. 812,684

Int. Cl.² C25B *13/08*

U.S. Cl. 162—102 **4 Claims**

1. In a method for manufacturing a diaphragm for use in an electrolytic cell of the type comprising depositing a fiber onto an electrolytic cathode screen, the improvement comprising:

(a) dispersing a slurry consisting essentially of highly branched thermoplastic fibers in a water-acetone medium containing a surfactant to form a slurry thereof said slurry being free of bonding or cementing agents,

(b) depositing the slurry onto a cathode screen to form a diaphragm of entangled highly branched thermoplastic fibers thereon,

(c) drying the deposited diaphragm.

4,138,315

PRODUCTION OF PAPER SHEETS, BOARDS AND PULP MOLDED ARTICLES FROM FIBRIDS FROM THE CONSTITUENTS OF THE EFFLUENT OBTAINED IN THE MANUFACTURE OF STYRENE BEAD POLYMERS

Bruno Sander, Ludwigshafen; Eckhard Bonitz, Frankenthal; Heinz Voss, Friedelsheim, and Wolfgang Gaerber, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 674,127, Apr. 6, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,746

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1975, 2516564

Int. Cl.² D21F *11/00*

U.S. Cl. 162—146 **6 Claims**

1. Paper sheets, boards or pulp-molded articles prepared from aqueous suspensions of discrete fibrids, said fibrids being obtained by dissolving in an organic solvent the precipitated or flocculated and then isolated macromolecular constituents of the aqueous phase, as taken from the bead polymerization of styrene in the presence of protective colloids, which aqueous phase remains after separating off the bead polymer, and by introducing the resulting solution into water under the action of shearing forces sufficient to form fibrids having a specific

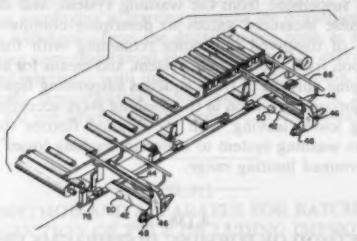
surface area of from 10 to 30 m^2/g, a freeness of from 15 to 30° SR, a length of from 0.5 to 20 mm and a thickness of from 1 to 10 μ, together with an absorption capacity for water of from 4 to 9 times their weight.

4,138,316

FABRIC STRINGING METHOD FOR NON-CANTILEVERED FOURDRINIER MACHINE

Norbert Kessler, Baldwinsville, and John M. Robbins, Fulton, both of N.Y., assignors to The Black Clawson Company, Middletown, Ohio

Filed Feb. 27, 1978, Ser. No. 881,375
Int. Cl.² D21F 1/26
U.S. Cl. 162—200 **10 Claims**



10. A method of installing a continuous loop drainage fabric on a non-cantilevered fourdrinier machine comprising:

providing a pair of substantially C-shaped carriages each having an upper support means and a lower base means extending beneath said upper support means in spaced relationship thereto,

positioning said carriages adjacent the side of the fourdrinier machine,

folding a continuous loop fabric substantially in half longitudinally,

inserting a lower portion of said loop between said support means and said base means while an upper portion of said loop is positioned above said support means,

rolling both said carriages toward said machine until said support means thereof are positioned beneath said side framing of said machine,

activating jack means carried by each support means to lift said side framing,

removing supporting blocks from said framing of said machine to form a gap extending the length of said machine beneath said framing,

moving said fabric transversely of the length thereof with said lower portion of said loop passing through said gap and said upper portion of said loop passing over said framing,

unfolding said fabric to provide a single thickness loop,

stringing said unfolded fabric to its operating position,

replacing said support blocks,

deactivating said jack means,

and rolling said carriages away from said machine.

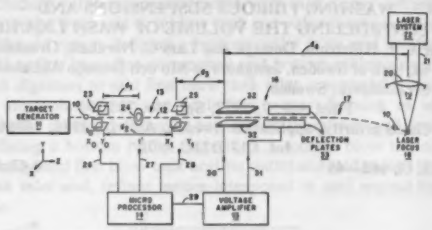
4,138,317

MAGNETIC CONFINEMENT SYSTEM USING CHARGED AMMONIA TARGETS

Gary D. Porter, Livermore, and Anatoly Bogdanoff, Danville, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 698,553, Jun. 22, 1976. This application Jun. 5, 1978, Ser. No. 912,782
Int. Cl.² G21B 1/02
U.S. Cl. 176—1 **3 Claims**

1. An apparatus utilizing electrically charged targets for producing a plasma comprising: means for generating electrically charged targets and injecting same along an initial trajectory; a magnetic confinement system positioned and constructed to receive charged targets injected along said trajectory; a guidance system for maintaining charged targets generated by said generating means along said trajectory; a laser means having a focal point located within said magnetic confinement system through which said trajectory passes for illuminating charged targets which pass through said focal poin causing ionization of such targets and production of a plasma within said magnetic confinement system; said guidance system comprising electrostatic sensing means for generating signals responsive to x and y coordinates and time of travel of



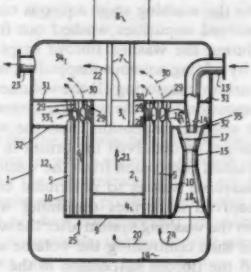
an associated charged target over a predetermined distance along said initial trajectory, micro processing means for receiving said signals from said sensing means for real time calculation of position, velocity, and direction of such an associated charged target and for producing calculated course correction output signals, electrostatic deflecting means positioned in alignment with said sensing means and responsive to said calculated course correction output signals from said micro processing means for correcting the trajectory of such an associated target, and amplifier means operatively connected between said micro processing means and said deflecting means for amplifying said calculated course correction output signals.

4,138,318

NUCLEAR REACTOR SYSTEM OF THE FAST TYPE

Jan E. Speelman, Bergen, Netherlands, assignor to Neratoom B.V., The Hague, Netherlands

Filed Jan. 19, 1976, Ser. No. 650,265
Int. Cl.² G21C 15/04
U.S. Cl. 176—18 **5 Claims**



1. In a nuclear energy reactor system a nuclear reactor core of nuclear fuel; a breeding blanket having a portion which radially surrounds the core; a reactor vessel surrounding the core and blanket and providing an inflow plenum below the core and blanket and an outflow plenum above the core and blanket, the vessel having supply and discharge connections for a flow of coolant through the vessel; means for dividing the flow of coolant into two separate currents and for passing one of the currents separately in straight flow upward through said

portion of the breeding blanket while passing the other current upward through the reactor core into the outflow plenum; means for discharging coolant from the upper end of said portion of said breeder blanket partly into the outflow plenum and partly into the inflowing coolant entering the vessel through said supply connection; and means including a pump system for mixing the inflowing coolant with the coolant being discharged thereinto from said portion of said breeder blanket.

4,138,319

NUCLEAR REACTOR INSTALLATION WITH A LIGHT-WATER REACTOR

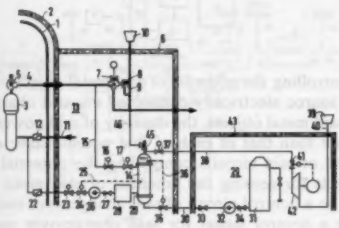
Hans-Peter Schabert, and Bernhard Böhm, both of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Nov. 30, 1976, Ser. No. 746,176

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554180

Int. Cl.[2] G21C *15/00*

U.S. Cl. 176—65 **2 Claims**



1. Nuclear reactor installation with a light-water reactor comprising a first heat exchanger, a primary and a secondary circulatory cooling loop connected in series through said first heat exchanger, said secondary circulatory cooling loop being a main cooling system for the installation, another secondary circulatory cooling loop connected to said first heat exchanger, a second heat exchanger connected in said other secondary circulatory cooling loop for providing emergency cooling, said second heat exchanger being a steam converter for producing low-pressure steam at a low-pressure side thereof having an inlet and an outlet and forming part of a third circulatory loop, a feedwater source independent of said main cooling system connected in said third circulatory loop at said inlet to said low-pressure side of said second heat exchanger, said feedwater source constituting a well located within the boundary of the nuclear reactor installation and having a water feed rate of 0.5 to 0.05 tons/hour per MW of thermal reactor power, said outlet of said low-pressure side of said second heat exchanger being connected to a blow-off line leading to the open air.

4,138,320

FLUIDIC SELF-ACTUATING CONTROL ASSEMBLY

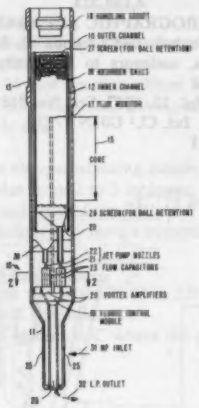
Alan L. Grantz, Santa Clara, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 29, 1978, Ser. No. 920,416

Int. Cl.[2] G21C *7/08*

U.S. Cl. 176—86 R **11 Claims**

1. A control assembly for a reactor responsive to a sudden change of fluid flow rate and/or neutron flux level comprising: an outer channel and an inner channel defining an annulus therebetween, said outer channel having fluid inlet means and fluid outlet means, said inner channel containing neutron absorber material and positioned within said outer channel so as to be partially within an associated reactor core, fluidic means located within said outer channel intermediate said inner channel and said fluid inlet and outlet means, said fluidic means including means responsive to fluid inlet pressure for directing under normal operating conditions fluid from said inlet means into a first portion of said inner channel forcing said neutron absorber material into a second portion of said inner channel, said fluidic means also including means responsive to a sudden decrease in fluid inlet pressure for directing fluid from said inlet means into said second portion of said inner channel



allowing said neutron absorber material to move into said first portion of said inner channel, flux monitor means positioned so as to extend into said first portion of said inner channel, and means responsive to a rapid increase in neutron flux for directing fluid from said inlet means into said second portion of said inner channel allowing said neutron absorber material to move into said first portion of said inner channel.

4,138,321

LIFTING DEVICE

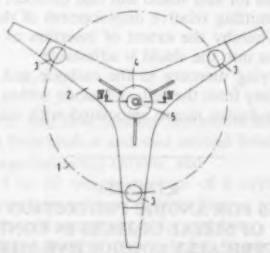
Manfred Scholz, Erlangen, and Bernd Gollasch, Nuremberg, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

Filed Apr. 27, 1977, Ser. No. 791,525

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619262; Mar. 2, 1977, 2709071

Int. Cl.[2] C21C *19/10*

U.S. Cl. 176—87 **8 Claims**



1. Lifting device for a horizontally seated cover of a nuclear-reactor pressure vessel comprising a traverse having means for holding a cover to be lifted and having a substantially central point of application for a lifting tool, and means for compensating for deviations from the horizontal of the cover held by said traverse, said compensating means comprising a pair of mutually connected eccentric pieces cooperable for adjusting said point of application on said traverse in a horizontal plane, said eccentric pieces comprising an eccentrically rotatable circular pulley with a vertical axis seated eccentrically in another rotatable circular pulley having a vertical axis, said first-mentioned

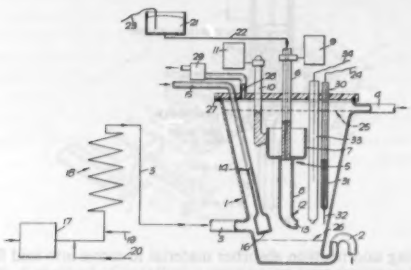
pulley eccentrically carrying said point of application for the lifting tool, said point of application being formed by a carrying bolt seated on said first-mentioned pulley, and a connecting head for the lifting tool releasably connected to said carrying bolt.

4,138,322

POLAROGRAPHIC APPARATUS

David Barnes, Caringbah, and Champa H. Metters, Buckley, both of Australia, assignors to University of Strathclyde, Glasgow, Scotland

Filed Jul. 12, 1977, Ser. No. 815,024
Int. Cl.[2] G01N *27/34*
U.S. Cl. 204—195 H **9 Claims**



1. Apparatus for use in the continuous polarographic analysis of a flowing stream of liquid including,

a cell having a floor, liquid inlet means opening into the cell above the floor and liquid outlet means located above the said inlet means;

means connected to the inlet means for effecting flow of liquid to be analysed through the cell;

a dropping mercury cathode extending into the cell, said cathode having an end portion terminating in a mercury-discharge tip directed towards said floor;

an open-ended tubular cathode shield surrounding the end portion of the cathode and located in the cell at a level intermediate the said inlet and outlet means, said shield having an upper cup portion and a lower stem portion, means on the stem portion defining a laterally-directed terminal orifice, said orifice having a cross-sectional area less than that of the stem portion;

support means for said shield and said cathode, said support means permitting relative displacement of the shield and cathode whereby the extent of insertion of the cathode end portion into the shield is adjustable;

means supplying mercury to the cathode and discharging used mercury from the cell; and anode within the cell; and

electrical conductor means associated with said anode and cathode.

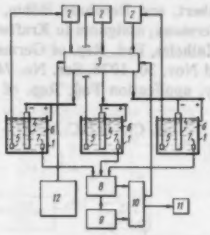
4,138,323

APPARATUS FOR ANODIC PROTECTION AGAINST CORROSION OF METAL OBJECTS IN CONTACT WITH ELECTRICALLY CONDUCTIVE MEDIA

Nikolai N. Statsenko, Gvardeisky prospekt, 59b, kv. 91; Vladislav S. Kuzub, ulitsa Lenina, 57, kv. 22; Vladimir G. Moisa, ulitsa Gagarina, 14 b, kv. 53, and Evgeny A. Kryzhny, ulitsa Gagarina, 54 b, kv. 47, all of Severodonetsk Voroshilovgradskoi oblasti, U.S.S.R.

Filed Sep. 29, 1976, Ser. No. 727,844
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—196 **4 Claims**

1. An apparatus for anodic protection of metal objects in contact with electrically conductive media, comprising self-contained potentiostats for control of the potential of each of said metal objects, there being one potentiostat for each metal object, a positive terminal of each of said potentiostats being connected to the respective metal object; a controlled change-over switch electrically connecting said potentiostats to said metal objects; an auxiliary electrode, which is in contact with said electrically conductive medium and connected to a negative terminal of the respective potentiostat, for each metal object, said auxiliary electrodes serving as cathodes and said metal objects serving as anodes; a reference electrode which is in contact with said electrically conductive medium for each metal object, said reference electrode being connected to an input of the respective potentiostat, said potentiostats, reference electrodes and auxiliary electrodes defining independent



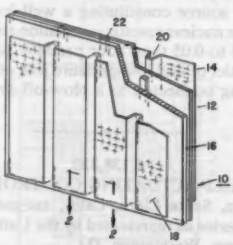
circuits controlling the potential of said metal objects; a stand-by power source electrically connected via said change-over switch to said metal objects, the capacity of said power source being higher than that of each of said potentiostats; a means independent of said circuits controlling the potential of said metal objects for sensing the potential of said metal objects connected to a control circuit of said change-over switch and generating a control signal for said change-over switch to electrically connect said stand-by power source to a metal object when its potential deviates from a preset value and to disconnect the respective potentiostat.

4,138,324

METAL LAMINATE STRIP CONSTRUCTION OF BIPOLAR ELECTRODE BACKPLATES

Lewis M. Meyer, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 640,646, Dec. 15, 1975, Pat. No. 4,059,216. This application Nov. 14, 1977, Ser. No. 851,427
Int. Cl.[2] C25B *1/08, 11/03, 11/10*
U.S. Cl. 204—284 **4 Claims**



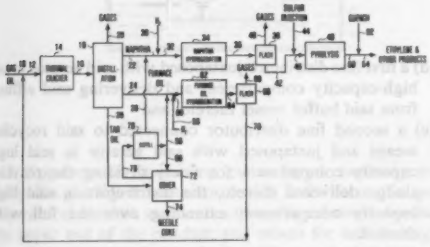
1. A bipolar electrode assembly for use in an electrolytic cell comprising: a foraminous titanium anode bearing upon the surface thereof an electrocatalytically active, corrosive resistant material; a planar solid titanium anode backplate connected to said foraminous titanium anode in a spaced apart parallel relation thereto by virtue of a series of channels formed in said foraminous titanium anode material; a spaced series of metal laminate strips having one face made of titanium and the opposing face made of steel connected to said planar solid titanium anode backplate on the titanium face; a planar solid steel cathode backplate connected to the steel face of said spaced series of metal laminate strips; and a foraminous steel

cathode connected to said planar solid steel cathode backplate in a spaced apart parallel relation thereto by means of a series of channels formed in said foraminous steel cathode, such that between 5 and 10 percent of the total surface area of said planar solid titanium backplate and said planar solid steel cathode backplate are in direct bonded contact to provide electrical current transmission therethrough while the remaining area is an air space to allow the venting of hydrogen to prevent the hydrogen embrittlement of the planar solid titanium anode backplate.

4,138,325
PROCESS FOR CONVERSION OF GAS OIL TO ETHYLENE AND NEEDLE COKE

Harold Beuther, Cheswick; Joel D. McKinney, Pittsburgh, and Harold E. Swift, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 22, 1977, Ser. No. 863,403
Int. Cl.[2] C10G 37/06; C07C 3/30
U.S. Cl. 208—50 **17 Claims**



1. A process for converting gas oil whose components mostly boil between 650 and 1,000° F. to a pyrolysis product containing ethylene and ethane and to needle coke comprising thermally cracking said gas oil at a temperature between 750 and 1,000° F. without added hydrogen and without a catalyst to produce a thermally cracked product including cracked naphtha whose components mostly boil within the range 80 to 450° F., cracked furnace oil and aromatic tar oil having components boiling within the range 800 to 1,000° F., delay coking said tar oil at a temperature between 775 and 900° F. to produce needle coke, coker furnace oil, and coker naphtha, passing a total naphtha stream including said coker naphtha and said cracked naphtha to a catalytic naphtha hydrogenation zone operated at a temperature between 500 and 850 ° F. to produce hydrogenated naphtha containing at least 10 volume percent of cycloparaffins, and passing said hydrogenated naphtha to a pyrolysis zone operated at a temperature between 1,300 and 2,300° F. for a residence time between 0.05 and 2 seconds without added hydrogen and without a catalyst for conversion to a pyrolysis product including ethylene and ethane, wherein the once-through yield of ethylene is more than twice the yield of ethane on a weight basis.

4,138,326
HYDROTREATING PROCESS AND CATALYST

Harold E. Swift, Gibsonia, and Roger F. Vogel, Butler, both of Pa., assignors to Gulf Research & Development, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 623,374, Aug. 12, 1977, abandoned. This application Aug. 23, 1977, Ser. No. 827,102
Int. Cl.[2] C10G 23/00, 17/00; B01J 29/06, 23/16
U.S. Cl. 208—108 **43 Claims**

1. A catalyst composite consisting essentially of:

(A) from 3 to 25 weight percent of tungsten in the form of metal oxide or metal sulfide, or any mixture thereof, calculated as the metal;

(B) from 35 to 80 weight percent of a laminar 2:1 layer-lattice aluminosilicate mineral possessing layer-lattice unit cells, each cell having an inherent negative charge balanced by cations exterior to said unit cell, said mineral corresponding to the following overall formula prior to drying and calcining:

$$[(Al3^{+}_{4-e-w}Y^{2+}_{3w})^{VI}(Q^{4+}_{8-x}Al^{3+}_{x})^{IV}O_{20}(OH)_{4-f}F_f]\cdot[dC]$$

where Al is aluminum;

Y is selected from the class consisting of nickel, cobalt and mixtures thereof;

Q is at least 0.95 mol fraction silicon ions, the remainder consisting of tetravalent ions having an ionic radius not to exceed 0.65 Å; and

F is fluorine;

C is at least one charge-balancing cation; and where e has a numerical value from 2 to 3 inclusive;

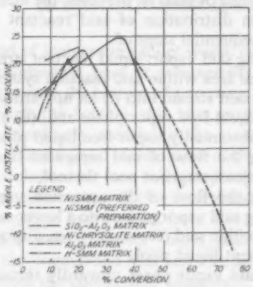
w has a numerical value from 0.01 to 2 inclusive, with the proviso that the quantity ew have a numerical value from 0.02 to 4 inclusive;

f has a value of 4 or less;

x has a numerical value from 0.05 to 2.0 inclusive;

y is the valence of the cation C.;

d is the number of cations C where the product



COMPOSITE OF CURVES FOR FIGS. 1-5 FOR SELECTIVITY OF ZEOLITIC CATALYSTS HAVING VARIOUS MATRICES.

$$dy = x + 3(e-2)w$$

and wherein said first bracket represents said layer-lattice unit cell formulation and said second bracket represents said charge-balancing cations; and

(C) from 5 to 50 weight percent of a crystalline zeolite having an alpha value of at least 20;

and wherein said composite is formed by:

(i) initially coating or impregnating component (B) with component (A); and

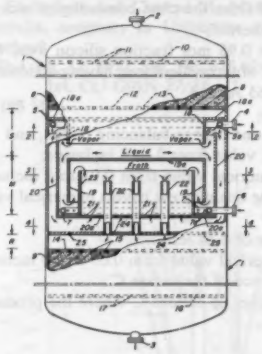
(ii) thereafter uniformly dispersing component (C) through the mixture of components (A) and (B) formed in step C).

23. A hydrotreating process which comprises contacting a hydrocarbon feed containing substantial amounts of materials boiling above 200° F. and selected from the group consisting of petroleum distillates, solvent deasphalted petroleum residua, shale oils and coal derived liquids or coal tar distillates in a reaction zone with hydrogen at hydrotreating conditions to obtain the conversion of at least 35 volume percent of said hydrocarbon feed with the catalyst of claim 1.

4,138,327
VAPOR/LIQUID DISTRIBUTOR FOR FIXED-BED CATALYTIC REACTION CHAMBERS

Norman H. Scott, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 4, 1977, Ser. No. 848,700
Int. Cl.[2] C10G *13/00, 23/06*
U.S. Cl. 208—146 5 Claims



1. In a cocurrent, mixed-phase catalytic reaction system wherein a vapor/liquid reactant stream flows downwardly through a fixed-bed of catalyst particles, the method for effecting the uniform distribution of said reactant stream which comprises the sequential steps of:

(a) introducing said vapor/liquid reactant stream into a first catalyst-free area within said reaction system, and therein separating said stream into (i) an upwardly-flowing, substantially liquid-free vapor phase and, (ii) a downwardly-flowing, substantially vapor-free liquid phase;

(b) reversing the flow of said separated liquid phase and forming a quasi-stagnant pool thereof;

(c) reversing the flow of the separated vapor phase and introducing said vapor phase into a lower second catalyst-free area, within said reaction system, disposed below said quasi-stagnant liquid pool;

(d) passing said vapor phase upwardly through said liquid pool at sufficient velocity to create a vapor/liquid froth therewith; and,

(e) distributing said vapor/liquid froth downwardly into a bed of catalyst particles, disposed below said quasi-stagnant liquid pool, across substantially the entire upper surface thereof.

4,138,328
USE OF A HIGH CAPACITY AERATION COMPARTMENT IN A MULTIPLE AERATION SYSTEM

Erwin Schnitzler, Kopernikusstrasse 26, Karlsruhe 21, Fed. Rep. of Germany (7500)

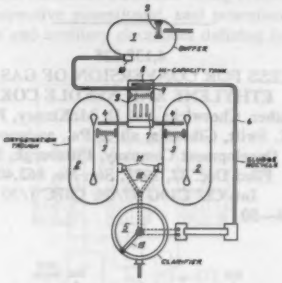
Filed Jun. 3, 1977, Ser. No. 803,313
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625415
Int. Cl.[2] C02C *1/08, 5/10;* B01D *21/10*
U.S. Cl. 210—7 7 Claims

1. In an apparatus for the treatment of waste water by an activated sludge process which comprises a buffer vessel, at least one oxidation trough provided with an aerating device and a fine distributor for subdividing the effluent from said buffer vessel into said oxidation trough, a clarifier connected to said oxidation trough for separating active sludge from an effluent therein, and means for recycling sludge from said clarifier, the improvement which comprises:

(a) an aerating means in said buffer vessel for partially reducing the biological oxygen demand in water to be purified in said buffer vessel;

(b) a high-capacity compartment between said buffer vessel and said oxidation trough receiving an effluent from said buffer vessel and delivering a suspension to said oxidation trough;

(c) an aerating device in said high-capacity compartment for aerating a suspension of sludge in water therein, said means for recycling sludge from said clarifier being connected to said high-capacity compartment;



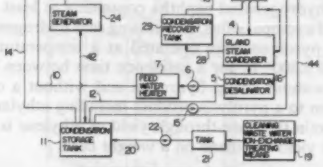
(d) a first fine distributor juxtaposed with said aerator in said high-capacity compartment and delivering said effluent from said buffer vessel thereto; and

(e) a second fine distributor connected to said recycling means and juxtaposed with said aerator in said high-capacity compartment for finely dividing the recycled sludge delivered thereto, the distributors in said high-capacity compartment extending over the full width thereof.

4,138,329
METHOD OF TREATING WASTE WATER OF A NUCLEAR POWER PLANT AND A SYSTEM THEREFOR

Norio Kita, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 1, 1975, Ser. No. 601,070
Claims priority, application Japan, Aug. 16, 1974, 49-93385
Int. Cl.[2] B01D *15/04*
U.S. Cl. 210—26 13 Claims



1. A method of treating waste water of a nuclear power plant including a steam turbine system constituting a closed loop, comprising the steps of:

(a) subjecting the waste water polluted with radioactivity to an ion-exchange treatment to lower the concentration of radioactive substances contained therein;

(b) heating the waste water to generate steam after the waste water is treated;

(c) supplying the steam obtained in step (b) to the gland seal sections of the turbine to provide a seal thereto;

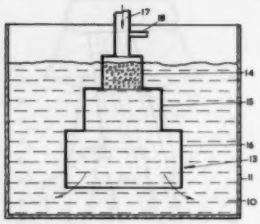
(d) condensing the steam back into water; and

(e) recirculating independently of said closed loop at least a portion of the water obtained in step (d) as feed water for generating the steam in step (b).

4,138,330
LIQUID TREATMENT

Michael E. Garrett, Woking, England, assignor to Boc Limited, London, England

Filed Mar. 21, 1977, Ser. No. 779,747
Claims priority, application United Kingdom, Apr. 14, 1976, 15422/76
Int. Cl.[2] B01F 3/04; C02B 1/34
U.S. Cl. 210—63 R 10 Claims



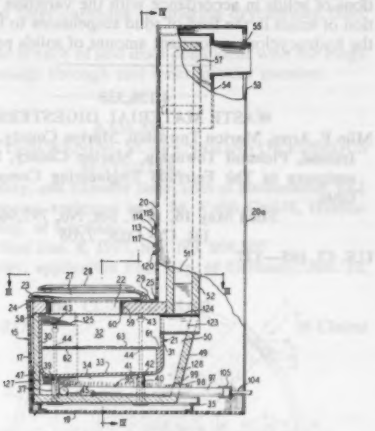
1. Apparatus for dissolving gas in liquid consisting essentially of a gas/liquid contactor device in the form of a generally vertical conduit, an inlet duct for a liquid stream leading to the upper end of the conduit, and means for introducing gas directly into such a stream before it passes into the conduit, wherein the conduit comprises at least two successive discrete and superimposed sections, the cross-sectional area of each such section being progressively larger than that of the section above or, in the case of the uppermost section, progressively larger than the crosssectional area of said inlet duct, whereby with a selected rate of flow of liquid into the conduit a turbulent gas/liquid zone is established in one of said sections while a coalescence zone is established in the section below so that coalesced bubbles rise from the coalescence zone into the turbulent gas/liquid contact zone while such smaller bubbles are swept from the turbulent gas/liquid contact zone into the coalescence zone below.

7. A method of dissolving gas in liquid which consisting essentially of introducing gas directly into a stream of the liquid before passage into a conduit and directing the liquid gas/stream through an inlet duct into the upper end of a gas/-liquid contactor device in the form of a generally vertical conduit comprising at least two discrete and superimposed successive sections, the cross-sectional area of each such section being progressively larger than that of the section above or, in the case of the uppermost section, progressively larger than the cross-sectional area of the inlet duct, a turbulent gas/liquid contact zone being established in one of said sections while a coalescence zone is established in the section below, the average downward velocity of the liquid within the coalescence zone being less than the rise velocity of a majority of undissolved gas bubbles swept into that zone from the turbulent gas/liquid contact zone above whereby such bubbles rise and coalesce, and the average downward velocity of the liquid within the turbulent gas/liquid contact zone being less than the rise velocity of coalesced bubbles formed in the zone below but greater than the rise velocity of smaller bubbles produced in the turbulent gas/liquid contact zone whereby such coalesced bubbles rise from the coalescence zone into the turbulent gas/-liquid zone while such smaller bubbles are swept from the turbulent gas/liquid contact zone into the coalescence zone below.

4,138,331
METHOD OF INCINERATING TOILET WASTES

Donald P. Frankel, Lake Geneva, Wis.; Willard E. Kendall, Elgin, Ill., and John F. Cooper, Williams Bay, Wis., assignors to Lake Geneva A & C Corporation, Lake Geneva, Wis.

Division of Ser. No. 627,756, Oct. 31, 1975, Pat. No. 4,051,561.
This application Jun. 15, 1977, Ser. No. 806,587
Int. Cl.[2] C02B 3/04
U.S. Cl. 210—63 R 10 Claims

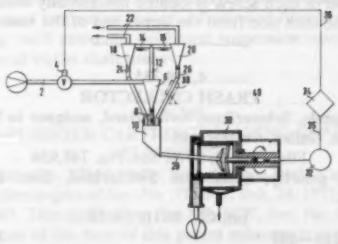


1. A method of incinerating toilet waste, comprising:
applying combustion heat in substantially the manner of applying heat to the bottom of a cooking pot under and to and through the bottom of a heat permeable upwardly opening receptacle containing the waste and effecting substantial boiling and incineration of the waste;
supplying preheated air into said receptacle; and
compelling vapor and products of combustion generated by said combustion heat to pass from said receptacle into a combustion zone chamber under said receptacle and through the combustion heat and into an afterburner flue leading from the combustion chamber.

4,138,332
METHOD AND DEVICE FOR DEWATERING SOLID SUSPENSIONS

Paul Schlöffel, Prof.-Dillinger-Weg 19, Bad Dürkheim, Fed. Rep. of Germany (6702)

Filed Jul. 14, 1977, Ser. No. 815,764
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1976, 2633477
Int. Cl.[2] B01D 43/00; B04B 13/00
U.S. Cl. 210—73 R 11 Claims



1. In a method for dewatering a feed of solid suspensions of varying concentrations of solids in water down to a low residual moisture by first passing the solid suspension in water into

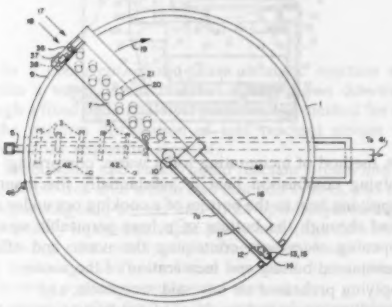
at least one hydrocyclone to effect partial dewatering of the feed of solid suspension in water into a first component of water with a reduced amount of solid and a second component of partially dewatered solid suspension, and then passing the partially dewatered solid suspension into a pusher centrifuge to dewater the partially dewatered solid suspension to a third component of solids of low residual moisture and a fourth component of water separated from the third component of solids of low residual moisture, the improvement comprising regulating the feed of solid suspensions of varying concentrations of solids in accordance with the variation in concentration of solids in the feed of solid suspensions to introduce into the hydrocyclone a constant amount of solids per unit time.

4,138,333

WASTE MATERIAL DIGESTERS

Milo F. Arms, Marion Township, Marion County, and James S. Ireland, Pleasant Township, Marion County, both of Ohio, assignors to The Fairfield Engineering Company, Marion, Ohio

Filed May 16, 1977, Ser. No. 797,568
Int. Cl.[2] C02C *1/08*
U.S. Cl. 195—127 **9 Claims**



1. In a digester having a receiver with an inlet side and an exit side to receive and hold material during digestion and a carriage which moves over said material during digestion and carries rotatable screws for agitation of the material, the improvement which comprises a plurality of screws extending in a generally vertical direction, said screws being disposed at an angle to the vertical in which the bottom of each said screw is positioned forward of and toward the inlet side from the top of the screw.

9. A digester for the bacterial decomposition of organic matter having a digestion zone with an inlet side from which raw material is received and an exit side to which digested material is discharged, said digester including a carriage which extends above the mass of material being digested and carries a plurality of agitating screws extending downwardly into the waste material and movable through the mass, said screws being characterized by a generally vertical alignment in which the bottom of each screw is located horizontally ahead of and toward the inlet side from the upper end of the same screw.

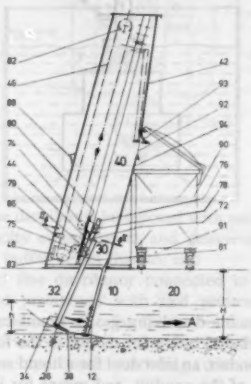
4,138,334

TRASH COLLECTOR

Karl Rimmele, Schmerikon, Switzerland, assignor to Mecafina S.A., St. Gallen, Switzerland

Filed Dec. 8, 1976, Ser. No. 748,456
Claims priority, application Switzerland, Dec. 11, 1975, 16113/75
Int. Cl.[2] B01D *35/16*
U.S. Cl. 210—159 **17 Claims**

1. A trashrack installation for liquid-borne trash, said installation having trash collecting rack rods and a rack cleaner mechanism for cleaning said rack rods, said cleaning mechanism including a tilting mechanism and a toothcomb mounted on said tilting mechanism, said installation further having a carrier for said toothcomb, a guiding device, a drive unit and a conveyor mechanism, said tilting mechanism being mounted on said carrier to allow for tilting said toothcomb between a cleaning position and an inoperative position, said drive unit and conveyor mechanism being operatively connected with each other and with said carrier to move said carrier along said guiding device in a lifting or lowering direction, said conveyor mechanism including two tension member sections connected with said tilting mechanism and with said drive unit, a first of said sections being in a positive lifting drive connection with said carrier and the second of said sections being in a positive lowering drive connection with said carrier and having a



portion arranged to draw the carrier downwards and also being operatively connected with said tilting mechanism to move said toothcomb towards said inoperative position in conjunction with a lowering operation, said first tension member section also being operatively connected with said tilting mechanism to move said toothcomb towards said cleaning position in conjunction with a lifting operation, said carrier including a brake mechanism acting in opposition to both a lifting and lowering movement of the carrier along said guiding device, said brake mechanism providing a braking force sufficient to prevent movement of said carrier under gravity but insufficient to prevent said conveyor mechanism and drive unit moving the carrier in the lifting or lowering operation.

4,138,335

SEWAGE AERATING STRUCTURE

Declan S. Murphy, Valois, Canada, assignor to Atara Corporation, Canada

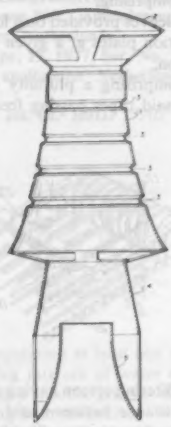
Continuation of Ser. No. 675,783, Apr. 12, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 812,654
Claims priority, application Canada, Apr. 21, 1975, 225103
Int. Cl.[2] C02C *1/12*; B01F *3/04*
U.S. Cl. 210—170 **4 Claims**

2. Means for aerating sewage, comprising

(a) a funnel shaped flue, having its narrowest end located slightly above the surface of a body of fluid sewage, and its widest end immersed perpendicularly therebelow, in which the flue has a multiplicity of spaced unperforated circumferential rings indented inwardly thereto and further including a second funnel fixed with its narrow end adjacent and surrounded by the bottom of the flue, and its wide end extending downwardly, the narrow end having a diameter at least two inches less than the diameter of the bottom of the flue,

(b) an impact plate positioned and shaped so as to cause collision and consequent shattering of the bubbles of gas in the fluid sewage, fixed over the exit of the flue a maximum distance of two times the equivalent diameter of the open

area of the exit and a minimum clearance of one inch, the exit being defined as an orifice having a clear fluid flow path a distance of two times its equivalent diameter therebelow,



(c) means for introducing gas into the interior of the flue, for entrainment and movement of sewage upwardly through the flue and subsequent collision with the impact plate above the surface of the body of sewage.

4,138,336

THIN LAYER CHROMATOGRAPHIC PLATES

Arthur Mendel, Vadnais Heights, and Roger W. Lange, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 2, 1977, Ser. No. 856,655
Int. Cl.² B01D *15/03*
U.S. Cl. 210—198 C **10 Claims**

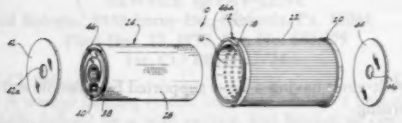
1. A thin layer chromatographic plate comprising a substrate and bonded thereto a layer of discrete, spherical inorganic metal oxide ceramic chromatographic particles having a surface area of 2 to 200 square meters per gram and pore diameters of 30 to 300 Å, said particles being bonded to said substrate by an inorganic metal oxide binder.

4,138,337

FILTER CARTRIDGE

Robert G. Smith, 1211 Hidden Oak Rd., Chesterfield, Mo. 63017

Filed Nov. 17, 1977, Ser. No. 852,397
Int. Cl.² B01D *27/02, 27/08*
U.S. Cl. 210—238 **4 Claims**



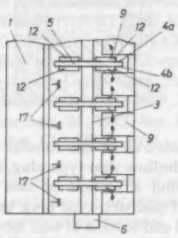
1. A filter cartridge comprising:
an annular, generally cylindrical outer member including a paper filter;
an annular, generally cylindrical inner member carrying a sorbant mass therewithin, and being coaxially disposed within said outer member;
said inner member being removable from said outer member along the common longitudinal axis of said members;
retaining means for initially retaining said inner member within said outer member;
said retaining means being a circular disc releasably affixed to each end face of said outer member;
said circular discs being fabricated of cardboard and being adhesively affixed to said outer member with a substance which deteriorates when exposed to drycleaning fluid to thereby release said discs from said outer member during use of said filter cartridge in filtering drycleaning fluid; and
a central hole in each of said discs coincident with the longitudinal passage through said inner annular member.

4,138,338

FILTER FOR THICKENING SUSPENSIONS OF FIBROUS MATERIAL

Johannes Velinsky, and Theodor Bahr, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jun. 8, 1977, Ser. No. 804,507
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626458
Int. Cl.² B01D *33/02*
U.S. Cl. 210—327 **18 Claims**



1. A filter for thickening suspensions of fibrous material, comprising a rotary shaft having axially extending passage means formed therein, a filter trough, rotating filter elements generally encased within said filter trough, each of said filter elements comprising a pair of filter disks generally juxtaposed to each other and defining a chamber therebetween, said filter disks being fixed to said shaft at generally right angles thereto for rotation therewith, each of said chambers being connected for communication with said passage means in said shaft, a suction head, said passage means in said shaft being connected to said suction head as to thereby complete communication between said suction head and said chambers, material outlet shaft means disposed generally between pairs of said filter disks, turbulence generating means for generating a turbulence in the material carried within said filter trough, and at least one ejector vane means operatively connected to each pair of said filter disks for rotation therewith and for mechanically removing thickened suspension material from said filter trough and depositing such removed thickened suspension material into said material outlet shaft means.

4,138,339

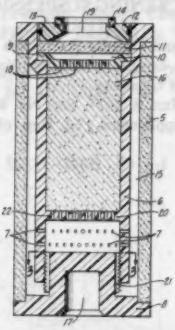
FILTER-PURIFIER CARTRIDGE HAVING SEPARABLE ELEMENTS

Isadore Turetsky, 23940 Welby Way, Canoga Park, Calif. 91307

Continuation-in-part of Ser. No. 771,777, Feb. 24, 1977, Pat. No. 4,107,047. This application Dec. 29, 1977, Ser. No. 865,739
The portion of the term of this patent subsequent to Aug. 15, 1995, has been disclaimed.
Int. Cl.² B01D *27/08, 29/26*
U.S. Cl. 210—337 **7 Claims**

1. A filter-purifier cartridge for liquids adapted to be inserted

in a filter apparatus, comprising: a tubular purifier element containing a purifying medium supported by a perforated partition within its hollow core, said tubular element being concentrically enlarged at one end section, an internal shoulder within, an outlet passage, and an external flange at said enlarged end section; a perforated disk having an offset rimmed section being inserted and contained against said internal shoulder by a similarly inserted permeable porous disk and a sealing ring within the hollow core of said enlarged tubular section, and circumferentially disposed perforations at the opposite unexpanded internally threaded end section of said tubular purifier element; said tubular purifier element inserted into the hollow core of a tubular filter, one end of said tubular filter being sealed and positioned by the flange and enlarged circumferential end section of the tubular purifier element; the unexpanded section of said tubular purifier element being



spaced from the sidewall of the tubular filter by means of a flanged, threaded, hollow step-type plug, a series of axial channels disposed around a section of said step-type plug, the threaded section of said step-type plug being inserted into the internally threaded end section of said tubular purifier element, the adjacent end of said tubular filter being sealed and positioned by the unthreaded section and flange of said hollow step-type plug, the purifying medium contained within the hollow core of said purifier element between the perforated disk resting against the internal shoulder of the expanded end section of said purifier element, and said perforated partition; said hollow core of the purifier element communicating with the annular space between the positioned tubular filter and said purifier element by means of the axial channels of said step-type plug and the circumferentially disposed perforations in said tubular purifier element.

4,138,340

ENDLESS BELT CONVEYOR FOR COLLECTING FLOATING MATTER FROM WATER SURFACE

Masao Suzuki, Miura, and Tsutomu Yamajo, Yokohama, both of Japan, assignors to Bridgestone Tire Company Limited and Japan Ships Machinery Development Association, both of Tokyo, Japan

Filed Jul. 8, 1977, Ser. No. 814,076

Claims priority, application Japan, Jul. 8, 1976, 51-80344; Nov. 8, 1976, 51-148935[U]

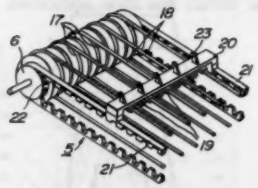
Int. Cl.[2] B01D *33/02*

U.S. Cl. 210—396 **2 Claims**

1. In an endless belt conveyor for selectively collecting high viscosity oil or coarse floating matter as in a drift oil recovery system, said conveyor having a pair of pulleys, one of which pulleys being located above water level and the other pulley being located beneath water level, a pair of driving bands each extending endlessly between said pulleys at widthwise ends of said pulleys and synchronously driven together with said pulleys, a plurality of connection plates each extending between said driving bands perpendicular to the driving direction of said band and fixed at each end to said bands at a given interval in the driving direction, a plurality of projections provided outwardly on an upper surface of each of said connection plates at a given interval, and a plurality of flexible ropes endlessly extending between said pulleys at a given interval, the improvement comprising,

(a) a plurality of sleeves provided on a lower surface of each of said connection plates at a given interval toward the driving direction,

(b) said ropes comprising a plurality of resilient rubbery bodies, one of said ropes passing freely through each of said sleeves,



(c) a rectangular filtering screen having a width substantially equal to the distance between said driving bands, said screen having end portions resiliently engaged with said projections in a detachable manner so as to entirely cover said conveyor, and

(d) a comb-type wiper having a plurality of notches, said notches having a size corresponding to the length and width of said projections, a top end of said wiper contacting said pulley above water level in a tangential direction.

4,138,341

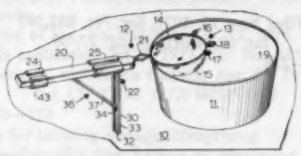
ADJUSTABLE SUPPORT ATTACHMENT FOR STRAINER HANDLES

Richard M. Adams, 1321 S. Eliseo Dr., Greenbrae, Calif. 94904

Filed Dec. 27, 1977, Ser. No. 864,391

Int. Cl.[2] B01D *35/28*

U.S. Cl. 210—470 **3 Claims**



3. A strainer having a sieve supported by a handle and also comprising:

a support device secured to said handle and including

a pivoted support rod adjacent one end thereof, said support rod having a pair of longitudinal guideways,

a pivoted tension arm, with its pivot spaced away from that of the support rod and comprising a pair of wire arms with outturned ends frictionally and slidably engaging said support rod guideways, and

locking means for locking said support rod in a closed position against said base member.

4,138,342
DEVICE FOR SEPARATING WATER FROM SUBSTANCES CONTAINED THEREIN

Cornelis G. Middelbeek, Nootdorp; Tjako A. Wolters, Zeist, and Jan B. Den Boer, Zoetermeer, all of Netherlands, assignors to Ballast-Nedam Groep N.V., Amstelveen and Skimovex B.V., The Hague, both of, Netherlands

Filed Apr. 19, 1977, Ser. No. 788,998
Claims priority, application Netherlands, Apr. 23, 1976, 7604390
Int. Cl.[2] B01D *17/02*
U.S. Cl. 210—522 30 Claims

1. A device for separating at least one water-insoluble substance from a flowing mixture of water and such substance, said substance having a specific gravity different from that of the water, comprising in combination:

a reservoir for receiving said mixture and having an outlet from which purified water from said mixture is withdrawn;

inlet means for introducing said mixture into said reservoir so that a liquid flow path is maintained within said reservoir from said inlet means to said outlet;

a separation unit within said reservoir between said inlet means and said outlet whereby all of the liquid flowing in said path is constrained to pass through said separation unit, said separation unit comprising a series of vertically spaced walls defining a vertically stacked series of separate separation channels, said channels presenting at one end of said separation unit a vertically extending series of inlet mouths for said liquid flowing in said path whereby said substance tends to be unevenly distributed to such mouths, and said channels discharging such liquid from the opposite end of said separation unit, said channels being inclined with respect to the horizontal to allow separation of said water and said substance therewithin whereby, at one of the ends of said separation unit, said substance escapes in a generally vertical direction away from said flow path;

means for collecting and removing the escaping substance; and

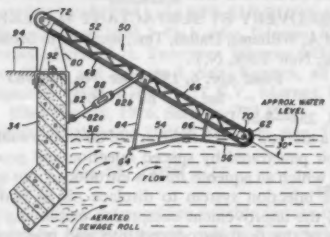
flow distributor means associated with said channels for causing the liquid of said flow path to be unequally distributed within said channels whereby at least some of said channels each receive substantially the same amount of said substance.

4,138,343
APPARATUS FOR REMOVING DEBRIS DURING SEWAGE TREATMENT

Alfred Bologna, 5133 Leroy Dr., Gibsonia, Pa. 15044

Filed Dec. 22, 1975, Ser. No. 643,379
Int. Cl.[2] B01D *33/14*
U.S. Cl. 210—526 2 Claims

1. A sewage treating system including a holding tank at least partially defined by a wall portion and having an open top, liquid sewage in the tank movable in a continuous roll-over current flow to promote aeration and generally maintaining a predetermined surface level in the tank, debris collecting apparatus in combination with the tank including conveyor means a rigid scoop assembly generally subjacent the lower end of the conveyor means whereby it is disposed in the liquid sewage near the surface thereof, the scoop assembly having a pan portion and a tine portion projecting beneath the conveyor means, the pan portion being oriented to continuously receive sewage flow thereover and direct it to the tine portion, the tine portion having spaced-apart elongated tines extending uniformly from the pan portion in the direction of current flow whereby debris in the sewage flow moving over the pan portion will collect on the tines and be urged to progress over and



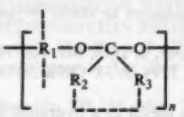
along the tines by force of the flow, the tines extending substantially straight from the pan portion and terminating in arcuate ends which curve upwardly, and the conveyor means being arranged to collect debris from the arcuate ends of the tines and deliver it outside the tank.

4,138,344
ERODIBLE AGENT RELEASING DEVICE COMPRISING POLY(ORTHOESTERS) AND POLY(ORTHOCARBONATES)

Nam S. Choi, Seoul, Rep. of Korea, and Jorge Heller, Palo Alto, Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 544,808, Jan. 28, 1975, Pat. No. 4,093,709.
This application Aug. 24, 1977, Ser. No. 827,223
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—1 16 Claims

1. A device for the controlled release of an active agent to an environment of use, said device comprising: a matrix of an erodible release rate controlling material, said material comprising a polymer of the formula:



wherein R_1 is a member selected from the group of divalent, trivalent and tetravalent radicals consisting of alkylene of 1 to 10 carbons; alkenylene of 2 to 10 carbons; alkyleneoxy of 2 to 6 carbons; cycloalkylene of 3 to 7 carbons; cycloalkylene of 3 to 7 carbons substituted with an alkyl of 1 to 7 carbons, alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and alkenyl of 2 to 7 carbons cycloalkenylene of 4 to 7 carbons; cycloalkenylene of 4 to 7 carbons substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and an alkenyl of 2 to 7 carbons, arylene, and arylene substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkenyl of 2 to 7 carbons; wherein R_2 and R_3 are selected from the group consisting of alkyl of 1 to 7carbons; alkenyl of 2 to 7 carbons; alkoxy of 1 to 7 carbons; alkenyloxy of 2 to 7 carbons; alkylene of 2 to 6 carbons; alkenylene of 3 to 6 carbons; alkyleneoxy of 2 to 6 carbons; alkenyleneoxy of 3 to 6 carbons; aryloxy; aralkyleneoxy of 8 to 12 carbons; aralkenyleneoxy of 8 to 12 carbons, oxa; OR_1O with R_1 as defined above; a heterocyclic ring of 5 to 8 carbons and oxygen atoms formed when R_2 and R_3 are taken together; a fused polycyclic ring of 8 to 12 carbon and oxygen atoms formed when R_2 and R_3 are taken together; a member selected from the group consisting of a heterocyclic and fused polycyclic rings when R_2 and R_3 are taken together, with at least one of said R_2 and R_3 a member selected from the group consisting of alkoxy, alkenyloxy and OR_1O; and n is greater than 10; an active agent

present in the matrix; and wherein the device, when in the environment of use erodes at a controlled and continuous rate, thereby releasing the active agent at a controlled and continuous rate over a period of time.

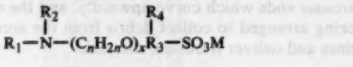
4,138,345

OIL RECOVERY BY SURFACTANT WATERFLOODING

Sherrod A. Williams, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 6, 1977, Ser. No. 784,983
Int. Cl.[2] E21B *43/22*
U.S. Cl. 252—8.55 D **8 Claims**

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems in which an aqueous fluid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising employing as at least a portion of the fluid introduced into said injection system an aqueous liquid containing a water-soluble anionic surfactant characterized by the formula:



wherein

is a lipophilic base provided by a C_8–C_{20} aliphatic hydrocarbon group or an aryl group substituted with a C_6–C_{18} aliphatic hydrocarbon group,

R_2 is a C_1–C_4 aliphatic group,

n is 2 or 3,

x is a number within the range of 1–10,

R_3 is a C_2–C_4 alkane group,

R_4 is hydrogen, a hydroxy group or a methyl group, and

M is an alkali metal, ammonium, or substituted ammonium ion.

4,138,346

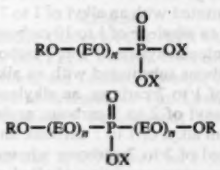
WATER-BASED HYDRAULIC FLUID

Assadullah Nassry, Riverview, and Jerrold F. Maxwell, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 6, 1976, Ser. No. 748,093
Int. Cl.[2] C10M *1/44, 3/38;* C09K *50/00;* C05B *11/16*
U.S. Cl. 252—32.5 **7 Claims**

1. A composition useful as a hydraulic fluid, lubricant and corrosion inhibitor consisting essentially of water, as a base, and minor effective amounts of:

(A) a phosphate ester selected from the group consisting of

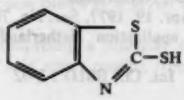


and mixtures thereof wherein EO is ethylene oxide; R is selected from the group consisting of linear or branched chain alkyl groups having about 6 to about 30 carbon atoms, and aryl or arylalkyl groups wherein the arylalkyl groups have about 6 to about 30 carbon atoms; X is selected from the group consisting of the residue of hydrogen, ammonia, an amine, an alkali or alkaline earth metal and mixtures thereof; n is a number from 1–50 and

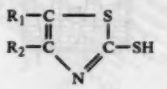
(B) at least one sulfur-containing compound selected from the group consisting of

(1) the ammonia, amine or metal salts of 5,6 and 7 substituted 2-mercaptobenzothiazole wherein the substituent is selected from the group consisting of chloro, bromo, sulfonic acid, amido, methyl, carboxylic acid and ethoxy;

(2) the ammonia, amine or metal salt derivatives of 2-mercaptobenzothiazole derived from the free acid of the formula:

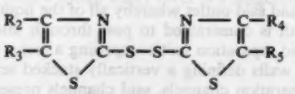


(3) the ammonia, amine or metal salts of derivatives of 2-mercaptothiazole derived from the free acid of the formula:



wherein said salts are formed by neutralization of said free acid with ammonia, an amine, an alkali oor alkaline earth metal hydroxide or carbonate wherein said metal is selected from the groups 1-A and II-A of the periodic table; wherein R_1 and R_2 are selected from the group consisting of hydrogen and alkyl group of 1 to 10 carbon atoms;

(4) 2,2′-dithiobisthiazole and derivatives thereof of the formula:



wherein R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen and an alkyl group having from 1 to 10 carbon atoms;

(5) 2,2′-dithiobis(benzothiazole) and 5,5′,6,6′and 7,7′substituted derivatives thereof; wherein the substituent is selected from the group consisting of dichloro, dibromo, disulfonic acid, diamido, dimethyl, dicarboxylic acid, and diethoxy;

(6) 2-mercaptonaphthothiazole;

(7) 2,2′-dithiobis(naphthothiazole);

(8) diphenyl sulfide;

(9) diphenyl disulfide;

(10) di-tert-butyl disulfide; and

(11) ditertiary butyl sulfone; the weight ratio of said phosphate ester to said sulfur-containing compound being in the range of from about 25:1 to about 1:1 based upon the weight of sulfur in the sulfur-containing compound.

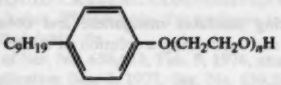
4,138,347

SYNTHETIC DIESTER LUBRICATING OILS CONTAINING OVERBASED CALCIUM SULFONATES AND NONYLPHENOL ETHYLENE-OXIDE ADDUCTS

Wheeler C. Crawford, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,614
Int. Cl.[2] C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33 **6 Claims**

1. A synthetic diester lubricating oil containing an effective amount of overbased calcium sulfonates and from about 0.5 to about 1.5 weight percent of said oil of an adduct of the formula:



wherein n ranges from 1 to 9.5; said adduct serving to disperse and/or solubilize said calcium sulfonates in said oil and to enhance the oxidation protection of said oil.

4,138,348

LUBRICANT FOR USE IN NON-CHIP METAL FORMING

Hans D. Grasshoff, Hamburg, Fed. Rep. of Germany, assignor to Deutsche Texaco Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 3, 1974, Ser. No. 475,484

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1973, 2330806

Int. Cl.² C10M *1/54*

U.S. Cl. 252—42.1 **8 Claims**

1. A lubricant comprising:
(a) 20 to 50 weight percent of a base material selected from the group consisting of a neutral fat and a vegetable oil,
(b) 10 to 30 weight percent of an alkali metal soap,
(c) 0.5 to 6 weight percent of an alkali metal salt of a boric acid, and
(d) water, the remainder.

4,138,349

SILICONE LUBRICANT COMPOSITIONS CONTAINING TRISCHLOROETHYL-PHOSPHITE AND/OR BIS-CHLOROETHYL CHLOROETHYL PHOSPHONATE

Edgar D. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jan. 10, 1977, Ser. No. 758,097

Int. Cl.² C10M *3/44, 3/40, 3/24*

U.S. Cl. 252—49.9 **14 Claims**

1. A silicone lubricant composition consisting essentially of 100 parts by weight organopolysiloxane having a viscosity varying from 25 to 100,000 centipoise at 25° C. wherein the organo groups are selected from the class consisting of monovalent hydrocarbon radicals and halogenated hydrocarbon radicals with from 0.01 to 1 part by weight of a chlorinated compound selected from the class consisting of tris-chloroethylphosphite and bis-chloroethylchloroethyl phosphonate and mixtures thereof.

4,138,350

COLLECTOR COMBINATION FOR NON-SULFIDE ORES COMPRISING A FATTY ACID AND A SULFOSUCCINIC ACID MONOESTER OR SALT THEREOF

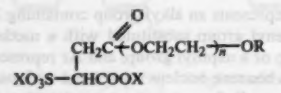
Samuel S. Wang, Cheshire, and Eugene L. Smith, Jr., Milford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 21, 1977, Ser. No. 862,991

Int. Cl.² B03D *1/02, 1/00*

U.S. Cl. 252—61 **10 Claims**

1. A collector combination for non-sulfide ores comprising from about 1 to about 99 weight percent of a fatty acid derived from a vegetable or animal oil and, correspondingly, from about 99 to about 1 weight percent of a monoester of a sulfosuccinic acid of the general formula



wherein R is an alkyl radical of about 4 to 18 carbon atoms, an aryl radical one to two carbocyclic rings, an alkaryl radical of about 7 to 18 carbon atoms or an aralkyl radical of about 7 to 18 carbon atoms, n has a numerical value of about 0 to 12, and X is hydrogen, alkali metal or ammonium ion.

4,138,351

ELECTROPHORETIC LIQUID DEVELOPER CONTAINING A METAL ALKYL SULPHONATE

Yvan K. Gilliams, Hever; Noël J. De Volder, Edegem; Robert J. Pollet, Vremde; Bernard H. Tavernier, Edegem; Nikolaas C. De Jaeger, Ghent, and Francis J. Sels, Kontich, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Sep. 14, 1976, Ser. No. 723,190

Claims priority, application United Kingdom, Sep. 16, 1975, 38068/75

Int. Cl.² G03G *9/12*

U.S. Cl. 252—62.1 L **18 Claims**

1. A liquid developer composition suitable for use in developing electrostatic charge patterns, which composition contains, in an electrically insulating carrier liquid having a volume resistivity of at least 10^9 Ohm.cm and a dielectric constant below 3, a suspended toner comprising pigment particles bearing organic polymeric material on their surfaces, and at least one ionic surfactant in the absence of which the toner particles would not be able to develop a negative surface charge pattern possessing a charge level corresponding to 50 V for a capacitance of 1.5×10^{-11} F.cm^{-2} up to an optical density of at least 0.8, said ionic surfactant being a metal alkyl sulphonate in which the metal ion is a bivalent metal ion selected from the group consisting of zinc(II), lead(II), cadmium(II) and copper(II) and in which the sulphonate group is present directly on an alkyl chain containing at least 6 carbon atoms in a straight line and has a positive charging effect on said toner, the sizes of said toner particles and the amount in which said sulphonate present being selected such that the toner can develop a charge pattern having said charge level up to an optical density of at least 0.8.

4,138,352

DETERGENT COMPOSITIONS WITH ANTISOIL AND ANTIREDEPOSITION PROPERTIES

Arthur S. Teot; Percy J. Hamlin, and Albert B. Savage, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 775,136, Mar. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 679,536, Apr. 23, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 878,122

Int. Cl.² C08B *11/193;* C11D *3/37;* D06M *13/18, 15/24*

U.S. Cl. 252—135 **4 Claims**

1. A detergent composition wherein the essential components thereof consist of
(a) about 20 percent by weight of a C_8–C_{22} alkyl monoether of a polyethylene glycol of about 5–20 alkylene oxide units,
(b) about 60 percent of sodium sesquicarbonate,
(c) about 10 percent of sodium silicate having a ratio of SiO_2/Na_2O of about 2–3/1,
(d) about 0.1–2 percent of a hydroxybutylmethylcellulose having a DS of about 1.5–2.3 and an MS of about 0.01–0.6, and
(e) about 10 percent of Na_2SO_4.

4. A detergent composition which consists essentially of
(a) about 20 percent by weight of a C_8–C_{22} alkyl monoether of a polyethylene glycol of about 5–20 alkylene oxide units,
(b) about 25 percent of sodium nitrilotriacetate,
(c) about 10 percent of sodium silicate having a ratio of SiO_2/Na_2O of about 2–3/1,
(d) about 1 percent of a hydroxybutylmethylcellulose having a DS of about 1.5–2.3 and an MS of about 0.01–0.6, and
(e) about 44 percent of Na_2SO_4.

4,138,353
CORROSION INHIBITING COMPOSITION AND PROCESS OF USING SAME

Richard J. Lipinski, Aurora, Ohio, assignor to The Mogul Corporation, Chagrin Falls, Ohio

Filed Apr. 1, 1977, Ser. No. 783,646
Int. Cl.[2] C23F *11/16*; C02B *5/02, 5/06*; C23F *11/12*
U.S. Cl. 252—181 **25 Claims**

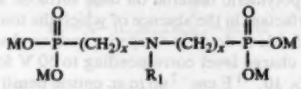
1. A composition for inhibiting mineral scale and corrosion of metal in the presence of water which comprises, parts based on a million parts by weight of water, from about:

(a) 0 to 50 parts by weight of an azole,

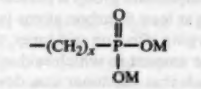
(b) up to 100 parts by weight of citric acid or its alkali metal salts,

(c) 0 to 100 parts by weight of a metal molybdate; wherein either the citric acid, alkali metal salt of citric acid or combinations thereof alone or with the molybdate is present in an amount of at least about 3.0 parts per million, and

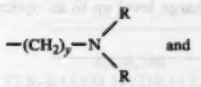
(d) a corrosion inhibiting amount of at least one amino methylene phosphonic acid and the derivatives thereof having the formula:



wherein R_1 is a monovalent radical selected from the class consisting of the formulae:

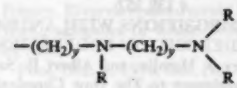


(i)



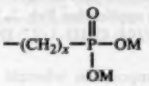
(ii)

and



(iii)

wherein R is



and y has a value of 1 to 8, x has a value of 1 to 4, and M is a radical selected from the class consisting of hydrogen, an alkali or alkaline earth metal, ammonium, an amino radical and an alkyl or substituted alkyl radical having 1 to 4 carbon atoms.

4,138,354
PREPARATION OF MANGANESE/COBALT BROMIDE

Irving Sochol, Baltimore, and Jay Y. Welsh, Catonsville, both of Md., assignors to Chemetals Corporation, Baltimore, Md.

Filed Dec. 12, 1977, Ser. No. 859,281
Int. Cl.[2] B01J *27/08, 23/84*; C01B *9/04*
U.S. Cl. 252—182 **11 Claims**

1. A method for the preparation of mixed manganous bromide and cobaltous bromide solution, which comprises

(a) introducing manganese into an aqueous solution of cobaltous bromide in an amount less than the stoichiometric equivalent of cobalt present in said solution, while maintaining the solution at less than about 50° C.,

(b) adding bromine to the solution in an amount at least stoichiometrically equivalent to the manganese added in step (a),

(c) separating insoluble manganese and cobalt from the solution and recovering a solution of mixed Mn/Co bromide.

4,138,355
FLUORINE SUBSTITUTION IN 1,1,1-TRIHALOMETHANES

Louis L. Ferstandig, Ridgewood, N.J., assignor to Halocarbon Products Corporation, Hackensack, N.J.

Division of Ser. No. 712,401, Aug. 10, 1976, Pat. No. 4,078,007, which is a continuation-in-part of Ser. No. 619,534, Oct. 3, 1975, abandoned. This application Nov. 21, 1977, Ser. No. 853,695
Int. Cl.[2] C07C *19/08*; C23F *11/18*
U.S. Cl. 252—182 **1 Claim**

1. In the containing of a mixture of HF and antimony pentahalide in a vessel normally corroded thereby, the improvement which comprises adding thereto antimony trihalide in at least an approximately equimolar amount relative to the pentahalide, whereby corrosion of said vessel is inhibited.

4,138,356
ENCAPSULATED FLAME RETARDANT SYSTEM

David N. Vincent, Glenview, and Ronald Golden, Mt. Prospect, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 390,523, Aug. 22, 1973, Pat. No. 3,968,060. This application Feb. 19, 1976, Ser. No. 659,249
Int. Cl.[2] C09K *3/28*; C08K *5/50, 9/10*
U.S. Cl. 252—182 **10 Claims**

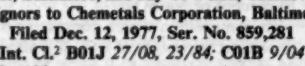
1. A composition for use in the production of a foamed plastic containing microcapsules which comprises as separate ingredients, a polyol polymer precursor and flame retardant microcapsules, said microcapsules having substantially spherical, solid, polymeric walls surrounding a substantially spherical core consisting essentially of a flame retardant material, said microcapsules having an average particle diameter of below about 5 microns, said capsule wall comprising a polyhydroxy-bearing polymer.

4,138,357
THERMOCHROMIC MATERIAL

Akira Igarashi, Fujimiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 12, 1977, Ser. No. 796,284
Claims priority, application Japan, May 19, 1976, 51-57670
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—188.3 R **11 Claims**

1. A thermochromic material comprising a mixture of (1) a substantially colorless electron donating color former capable of forming a color upon reacting with an electron accepting acidic material, and (2) at least one compound represented by the following general formula (I)



(I)

wherein R represents an alkyl group containing 2 to 8 carbon atoms, a phenyl group substituted with a methoxy group, a benzyl group or a napthyl group, and Ar represents a benzene nucleus, or a benzene nucleus substituted with one or two of a nitro group, an alkyl group containing 1 to 4 carbon atoms, a methoxy group or a halogen atom, said compound being solid at room temperature and having a melting point between about 50° C. and about 200° C.

4,138,358

LIQUID CRYSTAL COMPOSITIONS

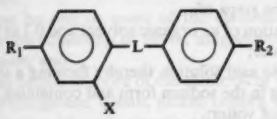
Mortimer M. Labes, Philadelphia, Pa., assignor to Temple University, Philadelphia, Pa.

Continuation of Ser. No. 656,613, Feb. 9, 1976, abandoned. This application Sep. 2, 1977, Ser. No. 830,204

Int. Cl.[2] C09K *3/34;* G02F *1/13*

U.S. Cl. 252—299 12 Claims

1. An eutectic liquid crystal mixture having an extended mesophase temperature range consisting of donor and acceptor compounds, said acceptor consisting of a p-cyano-p'-alkyl or -alkoxy substituted biphenyl liquid crystal compound, wherein said donor compound has the following molecular structure



where L is a linkage moiety selcted from the group consisting of

—CH=N—

and

—N=N—,

R_1 and R_2 are alkyl or alkoxy or alkylester groups of 1 to 8 carbons with no branch chains on the α and β carbons, and X is H or OH, with the proviso that R_1 always is alkyl and R_2 always is an alkoxy or alkylester group with the position of said R_1 and R_2 groups being interchangeable and the proviso that when X is OH, L is CH=N, R_1 is alkoxy or alkylester and R_2 is alkyl.

12. An eutectic liquid crystal mixture of p-cyano-p'-pentylbiphenyl and N-(p-methoxybenzylidene)-p-n-butylaniline.

4,138,359

LIQUID CRYSTAL COMPOSITION AND METHOD FOR MAKING SAME

Yutaka Mizukuchi, Saitama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

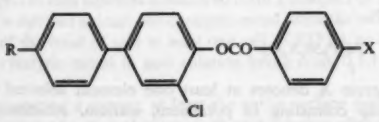
Filed Feb. 25, 1977, Ser. No. 771,991

Claims priority, application Japan, May 25, 1976, 51-59629

Int. Cl.[2] C09K *3/34;* G02F *1/13;* C07C *69/78, 79/46, 69/62*

U.S. Cl. 252—299 5 Claims

1. A liquid crystal compound having the formula:



wherein R represents an alkyl group of eight carbon atoms and X represents an alkyl group of eight carbon atoms, alkoxyl group of eight carbon atoms or a nitro group.

5. A liquid crystal composition comprising a mixture of at least two different compounds as defined in claim 1.

4,138,360

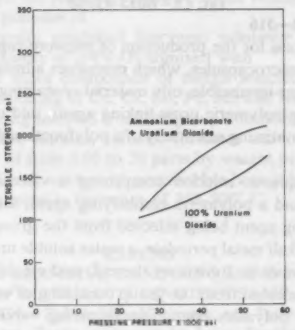
FUGITIVE BINDER FOR NUCLEAR FUEL MATERIALS

Timothy J. Gallivan, Wilmington, N.C., assignor to General Electric Company, San Jose, Calif.

Division of Ser. No. 612,084, Sep. 10, 1975, Pat. No. 4,061,700. This application Jan. 31, 1977, Ser. No. 764,378

Int. Cl.[2] G21C *3/62*

U.S. Cl. 252—301.1 R 10 Claims



1. A composition of matter in the form of a compacted structure suitable for sintering comprising a mixture of a nuclear fuel material, and from about 0.5 to about 7.0 percent by weight of a binder, said binder being substantially uniformly dispersed in the nuclear fuel materil so that said binder and said nuclear fuel material adhere, and said binder being selected from the group consisting of ammonium bicarbonate, ammonium bicarbonate carbamate, ammonium sesquicarbonate, ammonium carbamate and mixtures thereof.

4,138,361

RADIATION-CONVERSION SCREENS

Andre R. Suys, Hove, and Willy K. Van Landeghem, Sint-Gillis-Waas, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Mar. 8, 1977, Ser. No. 775,521

Claims priority, application United Kingdom, Mar. 18, 1976, 10974/76

Int. Cl.[2] C09K *11/46, 11/24, 11/12*

U.S. Cl. 252—301.33 25 Claims

1. A composition of matter which includes halide containing phosphor particles selected from the group consisting of (1) halide-containing rare earth metal compounds in which the host metal of the phosphor is a rare earth metal and the activator consists of one or more other rare-earth metals; (2) barium fluoride-chloride activated with europium (II), and (3) a cesium iodide, said particles being combined with at least one metal-organic substance in an amount whereby the fluorescence power of said phosphor particles is more resistant to adverse affects of moisture thereon in comparison to an identical composition of matter which does not include said metal-organic substance wherein said metal-organic substance is a member selected from the group consisting of:

(A) water-insoluble metal carboxylates,

(B) water-insoluble mercaptides, and

(C) organo-metallic compounds selected from the group consisting of organoantimony, organobismuth and organotin.

4,138,362

FORMATION OF MICROCAPSULES BY INTERFACIAL CROSS-LINKING, MICROCAPSULES PRODUCED, AND MICROCAPSULAR DISPERSION

Anthony E. Vassiliades, Deerfield, and Cheng H. Chang, Naperville, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 561,631, Mar. 24, 1975, abandoned. This application Jan. 18, 1977, Ser. No. 760,459

Int. Cl.[2] B01J *13/02*

U.S. Cl. 252—316 **38 Claims**

1. A process for the production of pressure-rupturable, oil-containing microcapsules, which comprises admixing:

(A) a water-immiscible, oily material containing an oil-soluble, non-polymeric cross-linking agent, said cross-linking agent consisting essentially of a polyfunctional isocyanate; and

(B) an aqueous solution comprising a viscosity-lowering agent and a polymeric emulsifying agent, said viscosity-lowering agent being selected from the group consisting of an alkali metal periodate, a water soluble urea-aldehyde prepolymer and mixtures thereof, said emulsifying agent being selected from the group consisting of water-soluble natural polymers containing recurring $-NH_2$ of $=NH$ groups, and water-soluble natural gums containing recurring hydroxy groups,

said admixing being conducted under conditions effective to form an oil-in-water emulsion, wherein said oily material containing said polyfunctional isocyanate is dispersed in the form of microscopic emulsion droplets in an aqueous, continuous phase, containing said emulsifying agent, and thereby surrounding each of said droplets with a solid cross-linked capsule wall formed by the cross-linking of said emulsifying agent by said polyfunctional isocyanate.

29. A process for the production of pressure-rupturable, oil-containing microcapsules, which comprises admixing:

(A) a water-immiscible, oily material containing an oil-soluble, non-polymeric cross-linking agent, said cross-linking agent consisting essentially of a polyfunctional isocyanate; and

(B) an aqueous solution of a polymeric emulsifying agent, said emulsifying agent being chitin or chitosan,

said admixing being conducted under conditions effective to form an oil-in-water emulsion, wherein said oily material containing said polyfunctional isocyanate is dispersed in the form of microscopic emulsion droplets with a solid, cross-linked capsule wall formed by the cross-linking of said emulsifying agent by said poly-functional isocyanate, said polymeric emulsifying agent being the sole coreactant for said polyfunctional isocyanate.

35. A process for the production of pressure-rupturable, oil-containing microcapsules, which comprises admixing:

(A) a water-immiscible, oily material containing an oil-soluble, non-polymeric cross-linking agent, said cross-linking agent consisting essentially of a polyfunctional isocyanate; and

(B) an aqueous solution of a polymeric emulsifying agent, said emusifying agent being a water soluble synthetic polymer containing recurring $-NH_2$ or $=NH$ groups, said admixing being conducted under conditions effective to form an oil-in-water emulsion, wherein said oily material containing said polyfunctional isocyanate is dispersed in the form of microscopic emulsion droplets with a solid, cross-linked capsule wall formed by the cross-linking of said emulsifying agent by said poly-functional isocyanate, said polymeric emulsifying agent being the sole coreactant for said polyfunctional isocyanate.

4,138,363

SILANE-ZEOLITE COMPOSITIONS

Elliot P. Hertzenberg, Wilmington, Del., and Howard S. Sherry, Cherry Hill, N.J., assignors to PQ Corporation, Valley Forge, Pa.

Filed Sep. 14, 1977, Ser. No. 833,122

Int. Cl.[2] B01J *29/06, 31/02*

U.S. Cl. 252—430 **15 Claims**

1. A composition of matter consisting essentially of:

(a) 96.65 to 99.95% by weight of zeolite in the sodium form, containing 15 to 35% water, and

(b) 0.05 to 3.35% by weight of silane having a hydrophilic functionality.

6. A process for preparing hydrophilic silane-zeolite compositions, comprising the steps of:

(a) preparing a solution of an organic solvent and 0.1 to 0.9% by weight of water;

(b) adding zeolite to said solution thereby forming a slurry, said zeolite being in the sodium form and containing 15 to 35% by weight of water;

(c) maintaining the temperature of said slurry between 22 and 95° C.;

(d) agitating said slurry and adding a solution of a silane in an organic solvent, said silane of hydrophilic functionality and present in an amount to provide 0.05 to 3.35% of the final composition by weight;

(e) agitating said slurry for a sufficient period of time to assure reaction of the silane with the zeolite surface, and

(f) removing said organic solvent and drying to recover the composition.

4,138,364

CATALYST FOR POLYESTERS AND METHOD FOR MAKING THE SAME

Henry L. King, Cary, and Chester C. Wu, Raleigh, both of N.C., assignors to Monsanto Company, St. Louis, Missouri, Decatur, Ala.

Filed Dec. 22, 1977, Ser. No. 863,284

Int. Cl.[2] B01J *31/12;* **C08G** *63/12, 17/15*

U.S. Cl. 252—431 N **16 Claims**

1. The method of preparing a catalyst suitable for the preparation of polyesters, comprising reacting germanium dioxide with a tetraalkyl ammonium hydroxide in the presence of a medium selected from the group consisting of water and a glycol suitable for use in the formation of fiber-forming polyesters, the molar ratio of tetraalkyl ammonium to germanium oxide to be dissolved being at least about 1.

4,138,365

CATALYST FOR THE MANUFACTURE OF METHACRYLIC OR ACRYLIC ACID

Masanobu Ogawa, and Toshitake Kojima, both of Takasaki, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1977, Ser. No. 758,352

Claims priority, application Japan, Nov. 27, 1976, 51-141784

Int. Cl.[2] B01J *27/14;* **C07C** *51/24*

U.S. Cl. 252—435 **2 Claims**

1. A catalyst consisting essentially of the following composition:

$$Pd_aP_bSb_cX_dO_e$$

wherein X denotes at least one element selected from the group consisting of potassium, sodium, rubidium, lithium, cerium, beryllium, magnesium, calcium, vanadium, strontium, zinc, thorium and rhenium, the subscripts a, b, c, d and e denote the number of the Pd, P, Sb, X and O atoms, and wherein a is 1, b is 1 to 42, c is 0.1 to 15, d is 0.1 to 15 and e is a number determined by the valences of other elements and usually from 3.7 to 143.5.

4,138,366

PROCESS FOR PRODUCING UNSATURATED ALIPHATIC ACIDS AND CATALYSTS THEREFORE

Wilfrid G. Shaw, Lyndhurst, and David B. Terrill, Bedford, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 683,367, May 5, 1976. This application Nov. 17, 1976, Ser. No. 742,489

Int. Cl.[2] B01J *23/16, 27/14, 23/84*

U.S. Cl. 252—464 14 Claims

1. A catalyst having the empirical formula:

$$Mo_aSb_bV_cY_dZ_eO_f$$

wherein

Y can be one or more of the elements selected from the group consisting of silver, magnesium, thallium and cadmium; and

Z can be one or more of the elements of the group consisting of manganese, cobalt, nickel, copper, iron, tin, chromium, titanium, bismuth, arsenic, phosphorus, rhenium, and zinc; and

wherein the number of atoms of each element present is represented by *a* through *f*,

wherein

a is a number from 6 to 18

b is a number from 0.1 to 6;

c is a number from 0.1 to 6;

d is a number from 0.01 to 6;

e is a number from 0 to 6; and

f is a number that satisfies the valence requirements of the other elements present.

4,138,367

METHOD OF PRODUCING CATALYST FOR CONVERSION OF CARBON MONOXIDE AND HYDROCARBONS IN ENGINE EXHAUST GAS

Junichi Mine; Akio Iizuka, both of Yokohama; Tetsuhiko Yoneshige, Yokosuka, and Hidefumi Ito, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 24, 1977, Ser. No. 809,714

Claims priority, application Japan, Jul. 1, 1976, 51-77079

Int. Cl.[2] B01J *21/04, 23/40*

U.S. Cl. 252—466 PT 7 Claims

1. A method of producing a catalyst for the conversion of carbon monoxide and hydrocarbons in the exhaust gas of internal combustion engines, the method comprising the steps of:

(a) preparing an aqueous solution of at least one thermally decomposable compound of a catalytic metal of the platinum group;

(b) adding at least one salt of ethylenediaminetetraacetic acid (EDTA) to said aqueous solution to form a complex of the EDTA salt and at least one catalytic metal, with the molar ratio of the total of said at least one salt of EDTA to the total catalytic metal in said solution being from 0.5:1 to 3:1;

(c) impregnating a carrier, at least the entire surface region of which is of active alumina, with said solution after the step (b);

(d) drying the impregnated carrier air until the water content of the carrier is not greater than about 5 percent; and

(e) baking the impregnated carrier in a stream of, at least in majority, steam at temperatures between 300 and 700° C.

4,138,368

CATALYST FOR REDUCING NITROGEN OXIDES

Makoto Kiyomiya, and Misao Kawai, both of Kawaguchi, Japan, assignors to Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jun. 6, 1977, Ser. No. 803,651

Claims priority, application Japan, Jun. 12, 1976, 51-69219

Int. Cl.[2] B01J *23/34, 23/72, 23/86*

U.S. Cl. 252—470 6 Claims

1. A catalyst for reducing nitrogen oxides which comprises a mixture of granules of

(A) a naturally produced inorganic substance composed predominantly of α-Fe_2O_3 admixed with

(B) one or more compounds of metals selected from the group consisting of Cu, Cr, Co, Fe, Mn and Ni, said compound being selected from the group consisting of oxides, hydroxides, nitrates, sulfates, formates and chlorides in amounts of from 0.01 to 30 parts by weight per 100 parts of (A), which mixture of granules has been subjected to a heat treatment in the range of 350–800° C.

4,138,369

PRESSURE SENSITIVE CONDUCTOR AND METHOD OF MANUFACTURING THE SAME

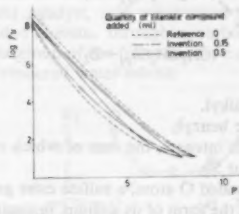
Kozo Arai; Shiomi Fukui; Masaki Nagata, and Teizo Kotani, all of Yokohama, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1977, Ser. No. 836,414

Claims priority, application Japan, Oct. 2, 1976, 51-118753; Feb. 21, 1977, 52-17978

Int. Cl.[2] H01B *1/02*

U.S. Cl. 252—512 21 Claims



1. A pressure sensitive conductor containing from 62 to 91.9% by volume of a molded, cured silicone rubber; from 8 to 35% by volume of electrically conductive metal particles; and from 0.1 to 3% by volume of an alkyl titanate compound selected from the group consisting of monoalkyl, dialkyl, and trialkyl titanate compounds, an alkyl group containing up to four carbon atoms.

4,138,370

MULTIPURPOSE LUBRICATING OIL ADDITIVE BASED ON ELECTROPHILICALLY TERMINATED ANION OF OXIDIZED ETHYLENE COPOLYMER

Robert L. Elliott, Scotch Plains, and J. Brooke Gardiner, Mountainside, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 680,077, Apr. 26, 1976, Pat. No. 4,051,050. This application Sep. 3, 1976, Ser. No. 720,507

Int. Cl.[2] C10M *1/26, 1/36, 3/20, 3/30*

U.S. Cl. 252—51.5 A 8 Claims

1. A process of preparing an oil soluble sludge dispersing additive for lubricating oil comprising the steps of:

(a) oxidizing a copolymer comprising principally ethylene and 20 to 80% propylene and having a (Mn) of from 1,000 to 500,000 to an oxygen content of from about 0.005 to 6% based on the weight of said copolymer;

(b) forming an anion of said oxidized copolymer by reacting

said oxidized copolymer in solution with an organolithium compound of the formula RLi, wherein R is selected from the group consisting of C_2 to C_{20} alkyl, aralkyl and cycloalkyl groups;

(c) reacting said anion with at least a molar equivalent of an electrophilic terminating compound of 1 to 60 carbons having the electron seeking group C = O and which will introduce a reactive site for further reaction, and then further reacting through said reactive site with a member selected from the group consisting of amines of 2 to 60 carbons and 1 to 12 nitrogen atoms, and polymethylol alkanes, to thereby form said additive.

4,138,371
WASHING METHOD USING AMPHOTERIC SURFACE ACTIVE AGENTS

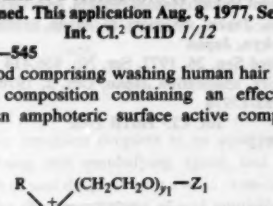
Robert J. Verdiccio, Succasunna, N.J., and Louis J. Nehmsmann, Ellicott City, Md., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 674,442, Apr. 7, 1976, which is a continuation-in-part of Ser. No. 561,673, Mar. 25, 1975, abandoned, which is a continuation of Ser. No. 349,560, Apr. 9, 1973, abandoned. This application Aug. 8, 1977, Ser. No. 822,703

Int. Cl.² C11D 1/12

U.S. Cl. 252—545 **13 Claims**

1. A method comprising washing human hair and skin with an aqueous composition containing an effective washing amount of an amphoteric surface active compound of the formula:



wherein R is C_{8-14} alkyl,

R_1 is C_{1-2} alkyl or benzyl;

y_1 and y_2 are each integers, the sum of which ranges from about 5 to about 50;

Z_1 is, with the bonded O atom, a sulfate ester group in free acid form or in the form of its sodium, potassium, magnesium or calcium salt,

Z_2 is H or Z_1; and

A is a halide, sulfate or C_{1-2} alkyl sulfate anion; or a mixture of such compounds.

4,138,372
RESIN COMPOSITIONS CONTAINING POLYEPOXIDES AND URETDIONES

Akio Nishikawa, Hitachi; Hitoshi Yokono, Katsuta; Ryuichi Simizu, Hitachiohta, and Junji Mukai, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 19, 1976, Ser. No. 650,066

Claims priority, application Japan, Feb. 7, 1975, 50-15393

Int. Cl.² C08G 59/40

U.S. Cl. 528—45 **16 Claims**

1. A resin composition comprising a polyepoxide having at least two vicinal epoxy groups, a uretdione compound having at least one uretdione ring in its structure, and an effective amount of a tetraphenyl borate-amine complex for effecting dissociation of said uretdione ring at a temperature above the melting point of the complex and for effecting reaction between isocyanate groups formed by the dissociation and between the isocyanate groups and epoxy groups, thereby to form an isocyanurate ring and oxazolidone ring in a cured resin of said composition.

4,138,373
PROCESS FOR PRODUCING FLUORINATED COPOLYMER HAVING ION-EXCHANGE GROUPS

Hiroshi Ukihashi, Tokyo; Tatsuro Asawa, Yokohama; Masaki Yamabe, Machida, and Haruhisa Miyake, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Sep. 27, 1977, Ser. No. 837,225

Claims priority, application Japan, Oct. 15, 1976, 51-122894

Int. Cl.² C08F 214/18, 2/18

U.S. Cl. 521—38 **7 Claims**

1. In a process for producing a cation exchange group-containing fluorinated copolymer having a high molecular weight and a high ion-exchange capacity which has a 1 to 50 mol % of a component having as a functional group a carboxylic acid group or a group which can be converted to a carboxylic acid group by copolymerizing a fluorinated ethylenic unsaturated monomer and a functional monomer having said functional group and which is represented by the formula

$$CF_2 = CX—OCF_2CFY)_l O—CFY')_n A$$

wherein l is 0 to 3; n is 0 to 12; X represents —F or $—CF_3$; Y and Y' respectively represent —F or a C_{1-10} perfluoro alkyl group; A represents —CN, —COF, —COOH, $—COOR_1$, —COOM or $—COONR_2R_3$; R_1 represents a C_{1-10} alkyl group; R_2 and R_3 respectively represent —H or R_1; M represents an alkali metal atom or a quaternary ammonium group; in the presence of a polymerization initiator source in an aqueous medium, the improvement wherein the copolymerization is carried out in less than 20 wt. parts of the aqueous medium per 1 part of said functional monomer under a pressure higher than 7 kg/cm^2 whereby a copolymer having a T_Q of higher than 150° C. and an ion exchange capacity of 0.5 to 4 meq/g dry polymer is recovered.

4,138,374
PROCESS FOR MANUFACTURING SHAPED POLYESTER ARTICLE USING SCRAP MATERIALS

Robert M. Currie, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 3, 1978, Ser. No. 875,101

Int. Cl.² C08L 67/02

U.S. Cl. 260—2.3 **15 Claims**

1. A process for manufacturing a shaped article of polyester material comprising the steps of:

(a) continuously polymerizing polyester in a closed, flowing, steady state polymerizing stream by a polycondensation reaction comprising

(i) adding low viscosity, low molecular weight polyester prepolymer to the beginning of the stream,

(ii) maintaining conditions in the stream at elevated temperature and reduced pressure, and

(iii) removing water and other polycondensation by-products from the stream, to yield high viscosity, high molecular weight virgin polyester at the end of the stream;

(b) adding scrap polyester to the virgin polyester at the end of the stream to yield polyester material blend;

(c) withdrawing polyester material blend from the polymerizing stream; and

(d) forcing the polyester material blend through an extrusion die.

4,138,375
PROCESS FOR THE PRODUCTION OF PULVERULENT, POURABLE ELASTOMER-FILLER MIXTURES OPTIONALLY CONTAINING PLASTICIZER OIL

Gerhard Berg, deceased, late of Marl, Fed. Rep. of Germany (by Ingrid Berg, legal representative), and Karl-Heinz Nordsiek, Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 855,868

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654358

Int. Cl.[2] C08L *1/28*

U.S. Cl. 260—17 R 28 Claims

1. In a process for the production of pulverulent, pourable elastomer-filler mixtures, optionally containing plasticizer oil, by mixing an aqueous emulsion of an elastomer solution with an aqueous dispersion of filler; introducing this mixture into water containing a precipitant; precipitating the elastomer-filler mixture while simultaneously removing the elastomer solvent by distillation; separating the thus-precipitated elastomer-filler mixture from the water; and drying the elastomer mixture under continuous agitation;

the improvement which comprises: emulsifying the elastomer solution in water in the presence of:

(a) 0.01–1.0% by weight of an anionic emulsifier, based on the amount of the elastomer solution;

(b) 0.001–0.1% by weight of an ionic protective colloid, based on the amount of the elastomer solution; and

(c) 0.001–0.1% by weight of a nonionic protective colloid, based on the amount of the elastomer solution;

combining the thus-stabilized solution-emulsion with an aqueous dispersion of filler, said dispersion having a pH of > 7, and containing 0.01–5% by weight, based on the amount of filler, of a tenside or a mixture of tensides, which when combined with components (a) through (c) of the elastomer emulsion do not result in a reduction of the surface activity of either the components (a) through (c) or the tensides, to obtain a homogeneous mixture stable with respect to storage and agitation; and

introducing this mixture into a precipitating bath, the pH of which is set at 1.0–5.0 by the addition of precipitants selected from acids, metallic salts subject to acidic hydrolysis in water and mixtures thereof, the temperature of which is above the azeotropic boiling point of the elastomer solvent and water, and which contains an amount of sodium silicate, based on the total elastomer content, such that, at the pH values of the precipitating bath, 0.001–20% by eight of colloidally dissolved silicic acid is produced therefrom.

4,138,376
COATING COMPOSITIONS

Peter F. Nicks, Maidenhead, England, assignor to Imperial Chemical Industries Limited, London, United Kingdom

Filed Jun. 7, 1976, Ser. No. 693,227

Claims priority, application England, Jun. 13, 1975, 25377/75

Int. Cl.[2] C09D *3/72, 5/02*

U.S. Cl. 260—22 TN 13 Claims

1. A coating composition which comprises a blend of:

(1) a dispersion in an organic liquid comprising a major proportion of aliphatic hydrocarbon of particles of an adduct or prepolymer of an aliphatic or aromatic di- or triisocyanate insoluble in the organic liquid, the dispersion being stabilized by a polymeric stabilizer, one component of which is soluble in the organic liquid and another component of which is soluble in the disperse particles, each component having a molecular weight of at least 500, and the ratio of the total molecular weights of the individual components of the two types being in the range 3:1 to 1:3, and

(2) a solution in a solvent comprising a major proportion of aliphatic hydrocarbon of a material containing groups selected from hydroxyl, primary and secondary amino, carboxyl and mercapto-groups which are reactive with the isocyanate groups contained in or yielded by the dispersion (1).

4,138,377
COATING COMPOSITION AND PROCESS FOR ITS PREPARATION

Yutaka Otsuki, Yokohama; Yoshihiko Araki, Kawasaki, and Kazuho Aoyama, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Nov. 16, 1977, Ser. No. 852,050

Claims priority, application Japan, Nov. 19, 1976, 51-138406

The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.

Int. Cl.[2] C09D *3/28, 3/733, 5/40*

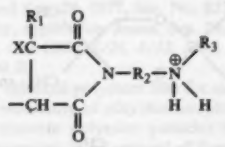
U.S. Cl. 260—23.7 A 9 Claims

1. A coating composition for cathode-precipitating electrodeposition consisting essentially of

(1) a curable resinous film-forming component capable of being rendered water-soluble by neutralization with a water-soluble inorganic or organic acid, and

(2) an aqueous medium or an organic liquid medium;

said component (1) consisting of an unsaturated organic compound having a molecular weight of 300 to 30,000 containing a carbon-carbon double bond in an amount corresponding to an iodine value of 50 to 500, said unsaturated organic compound being selected from the group consisting of (a) a homopolymer of a conjugated diolefin containing 4 to 8 carbon atoms, (b) a copolymer of at least two conjugated diolefins containing 4 to 8 carbon atoms, (c) a copolymer of at least one conjugated diolefin containing 4 to 8 carbon atoms and a vinyl monomer having an ethylenic unsaturation containing 2 to 20 carbon atoms, (d) a natural oil, (e) a natural fat and (f) a petroleum resin produced by cationic polymerization of petroleum cracking fractions containing 4 to 10 carbon atoms with a Friedel-Crafts catalyst, said unsaturated organic compound having bonded thereto, through a carbon-carbon bond, an organic basis group of the following formula in aqueous solutions when rendered water-soluble



wherein R_1 represents a hydrogen atom, a halogen atom or an organic group containing 1 to 3 carbon atoms;

R_2 and R_3 are identical or different and each represents an organic group containing 1 to 20 carbon atoms; and

X represents a hydrogen atom or a bond, and when X is a bond, the carbon atom to which R_1 is attached and the adjacent carbon atom to which hydrogen is attached may both form part of the main chain,

the amount of said organic basic group being 0.05 to 0.5 mole per 100 g of the film-forming component (1).

4,138,378
LIQUID POLYALKENE IN THERMOPLASTIC ELASTOMER SEALANT FORMULATION

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 23, 1977, Ser. No. 864,121

Int. Cl.[2] C08K *5/01;* C08L *51/00, 93/00*

U.S. Cl. 260—27 BB 11 Claims

1. A sealant composition comprising:

a rubbery ingredient consisting essentially of at least one hydrogenated thermoplastic elastomer, said elastomer having a formula selected from ABA and $(AB)_nY$ where A represents a block of polymerized monovinyl-substituted aromatic component, B represents a block of

polymerized conjugated diene before hydrogenation, Y represents a residue of a polyfunctional coupling agent or a polyfunctional intiator, and n has a value of at least 2;

a low molecular weight polyalkene plasticizer which is liquid at room temperature in an amount within the range of 10 to 200 parts by weight per 100 parts by weight of said hydrogenated thermoplastic elastomer;

a modifying resin selected from a group consisting of modified and unmodified rosin and rosin esters, esters of polymerized rosin, polyterpene resins, terpene-phenolic resins, coumarone-indene resins, diolefin-olefin resins, phenol-aldehyde resins, and aromatic resins, said resin being present in an amount within the range of 10 to 300 parts by weight per 100 parts by weight of said hydrogenated thermoplastic elastomer; and

a filler selected from calcium carbonate, aluminum silicate, clay, talc, kaolin and silica, said filler being present in an amount within the range of 25 to 250 parts by weight per 100 parts by weight of said hydrogenated thermoplastic elastomer.

4,138,379

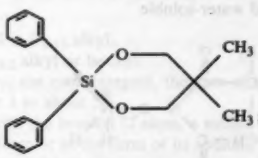
ORGANIC SILANE STABILIZED AND PLASTICIZED POLYCARBONATE COMPOSITION

Steven W. Scott, Mount Pleasant, S.C., and Howard A. Vaughn, Jr., Schenectady, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1977, Ser. No. 865,291
Int. Cl.[2] C08J 3/18
U.S. Cl. 260—29.1 R **4 Claims**

1. A plasticized and stabilized polycarbonate composition comprising in admixture an aromatic carbonate polymer and a plasticizing and stabilizing amount of an essentially monomeric organic silane characterized by the following general formulae:

a)



b)

4,138,380

PREPARATION OF COPOLYMER EMULSIONS OF AN α,β-UNSATURATED CARBOXYLIC ACID AND METHYL ACRYLATE

Eugene S. Barabas, Watchung, and Andrew Klein, Somerville, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Feb. 18, 1977, Ser. No. 770,198
Int. Cl.[2] C08L 33/02
U.S. Cl. 260—29.6 Z **3 Claims**

1. In a redox-initiated emulsion polymerization process for the preparation of a copolymer latex in which the copolymer comprises (1) from about 30% to about 75% by weight of methacrylic acid, ethacrylic acid or mixtures thereof and (2) from about 25% to about 70% by weight of methyl acrylate, in which all of the acid and the methyl acrylate is present in the reaction zone prior to initiation of the polymerization process, the improvement which comprises employing an effective emulsifying amount of the dioctyl ester of sulfosuccinic acid.

4,138,381

POLYMERIC THICKENERS, PROCESSES FOR THEIR PREPARATION AND USES THEREOF

David C. Chang, Springfield; Michael Fryd, Philadelphia, both of Pa., and Achim R. Krueger, Cherry Hill, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 567,942, Apr. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 416,200, Nov. 15, 1973, abandoned. This application Feb. 28, 1977, Ser. No. 772,864
Int. Cl.[2] C08L 33/08, 33/10
U.S. Cl. 260—29.6 TA **16 Claims**

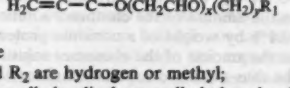
1. A liquid composition useful as a thickening agent in polymeric latices, the composition comprising

(A) up to 50%, by weight of the composition, of a polymer of polymerized units of

(1) about 10–98%, by weight of the polymers, at least one unsaturated carboxylic acid of 3–6 carbon atoms;

(2) about 1–50%, by weight of the polymer, at least one alkyl acrylate or alkyl methacrylate whose alkyl group contains 1–30 carbon atoms; and

(3) about 1–85%, by weight of the polymer, at least one ester of the formula



where

R and R_2 are hydrogen or methyl;

R_1 is an alkyl radical or an alkyl phenyl radical of 1-20 carbon atoms;

x is 5–80; and

y is 0–20; the total of 1, 2 and 3 being 100%; and

(B) as a solvent for (A),

(4) a glycol, or

(5) a glycol containing up to 50% of its weight of water; the composition being made by

(a) adding 10–50%, by weight of the total weight of monomers to be used, to a reaction vessel containing enough glycol, or glycol containing up to 50% of its weight of water, to give a final polymer concentration of less than 50% by weight;

(b) heating the contents of the vessel to at least 50° C;

(c) adding a portion of the free-radical catalyst to be used to the vessel; and then

(d) continuously adding the remainder of the monomers and catalyst to the vessel, and

(e) adding ammonia or a water-soluble organic amine after the polymerization is complete to adjust the pH to about 7 to 10.

4,138,382

HYDROPHILIC, WATER-SWELLABLE, CROSSLINKED, COPOLYMER GEL AND PROSTHESIS EMPLOYING SAME

Keith E. Polmanteer, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 1, 1978, Ser. No. 901,954
Int. Cl.[2] C08F 220/56
U.S. Cl. 260—29.6 TA **9 Claims**

1. A water swellable hydrophilic gel comprising a crosslinked copolymer of a water soluble vinylic constituent in aqueous solution and an olefinic hydrolyzable silane having the formula $X_mR_nSi(OR')_{4-(n+m)}$ wherein X is an unsaturated group, m is at least 1 and R' and R are organic radicals, n being 0 to 2, wherein the volume ratio of water to vinylic constituent is from about 0.5 to about 10 while the mole ratio of vinylic constituent to hydrolyzable silane is from about 50 to about 600, wherein copolymerization is via the unsaturated groups and wherein crosslinking is by condensation reactions.

4,138,383

PREPARATION OF SMALL BIO-COMPATIBLE MICROSPHERES

Alan Rembaum; Shiao-Ping S. Yen, and William J. Dreyer, all of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Nov. 24, 1975, Ser. No. 634,935
Int. Cl.[2] C08F 2/18, 4/34
U.S. Cl. 260—29.7 H 14 Claims

1. An aqueous emulsion polymerization composition for forming a suspension of discrete polymeric beads having a diameter below 3500 A containing an effective amount of at least 0.003 percent to 0.1 percent by weight of a free radical catalyst, a surface active agent and not more than 35% by weight of an ethylenically unsaturated monomer mixture comprising in percent by weight:

25-50% by weight of a freely water-soluble monoethylenically unsaturated monomer substituted with a covalent bonding group selected from carboxyl, amino or hydroxyl;

5-20% by weight of a polyunsaturated cross-linking agent; and

40-70% by weight of at least one sparingly, water-soluble, ethylenically unsaturated, second monomer having hydrophobic characteristics.

4,138,384

WATER-BASED CONTAINER END SEALING COMPOSITIONS

Daniel L. Neumann, Waukegan, Ill., assignor to The Dexter Corporation, Windsor Locks, Conn.

Filed Apr. 7, 1977, Ser. No. 785,332
Int. Cl.[2] C08L 9/08
U.S. Cl. 260—29.7 S 33 Claims

1. An aqueous-based sealent composition which is characterized by

(a) being adapted for use as a container end sealant,

(b) being substantially free of volatile organic solvent,

(c) having a Brookfield viscosity of about 2,800 to 12,000 cps.,

(d) being thixotropic,

(e) being settable under air-drying conditions and at ambient temperatures,

(f) being resistant to sag during setting, and

(g) being substantially stable, and

having at least about 65% by weight of total solids essentially consisting of

(i) about 15.2 to 23.4 parts of weight of synthetic, elastomeric, high molecular weight, acrylonitrile-butadiene copolymer with a predominance, on a weight basis, of butadiene, and

(ii) about 39 to 24.2 parts by weight of synthetic, elastomeric, high molecular weight, isobutylene-isoprene copolymer with a predominance, on a weight basis, of isobutylene, and

(iii) small, substantially uniformly dispersible particles of compatible, thixotropic, mineral flow control agent which imparts thixotropic and thickening characteristics to the sealant composition, and

having volatile liquid vehicle for said solids essentially consisting of water.

2. The aqueous-based sealant composition of claim 1, wherein said flow control agent comprises siliceous material.

4,138,385

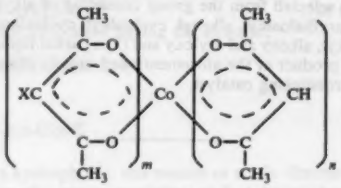
SUBSTITUTED ACETYLACETONATE COBALTIC PROMOTERS FOR UNSATURATED POLYESTER RESIN

Melville W. Uffner, Glen Mills; Donald E. Jefferson, Unionville; Charles G. Coe, Aston, and Burton D. Beitchman, Springfield, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 2, 1977, Ser. No. 830,182
Int. Cl.[2] C08L 67/00, 67/06
U.S. Cl. 260—40 R 20 Claims

1. In a process for curing a molding compound comprising an unsaturated polyester resin with an unsaturated monomer, soluble and copolymerizable therewith, the improvement which comprises:

incorporating at least a proportion effective for enhancing the rate of cure at molding temperatures and enhancing shelf life at lower temperature of a cobalt (III) complex of the formula:



wherein m can be 1, 2 or 3; m

n can be 0, 1, and 2, and M + n = 3; and

X is an electron withdrawing group, nonpolymerizable with said molding compound.

4,138,386

POLYESTER FILM FOR MAGNETIC TAPE

Masahiko Motegi, Hikone; Saburo Fujita, Otsu; Kazuo Okabe, Kyoto; Yasuki Miura, Otsu, and Satoyuki Minami, Mishima, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Sep. 29, 1977, Ser. No. 837,984
Claims priority, application Japan, Sep. 29, 1976, 51-116066
Int. Cl.[2] C08K 3/26, 3/32, 5/09, 5/52
U.S. Cl. 260—40 R 16 Claims

1. A biaxially oriented polyester film for magnetic tape, said film consisting essentially of ethylene terephthalate units, said film including discrete polyester particles in the form of a metal-polymer complex in an amount of from about 0.05% to 1.0%, based on the weight of film, said particles having an average size in the range of about 0.1 to 3.0 μm and containing about 0.03% to 5.0% of elemental lithium, about 0.03% to 5.0% of elemental calcium and about 0.03% to 10.0% of elemental phosphorus, said percentages being based on the total weight of the polyester particles, and said film also including inert pigments in an amount of about 0.001% to 0.7% based on the weight of said film, said inert pigments being selected from the group consisting of oxides and salts of metals in Groups II, III, and IV of the Periodic Table, and having an average size in the range of about 1.0 to 10.0 μm.

4,138,387

POLY(OLEFINIC MONOMER) FILLED-POLY(ORGANOSILOXANE) COMPOSITIONS

Ben A. Bluestein, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 428,010, Dec. 26, 1973, abandoned. This application Jun. 23, 1976, Ser. No. 698,816
Int. Cl.[2] C08K 3/10, 3/04; C08L 83/04
U.S. Cl. 260—42.26 8 Claims

1. A room temperature vulcanizable composition consisting essentially of:

(A) a stable dispersion consisting essentially of two phases:

(i) a continuous phase consisting essentially of ungrafted

linear fluid poly(diorganosiloxane) containing terminal silicon-bonded hydroxy groups which is substantially free of aliphatic unsaturation and silanic hydrogen and having a viscosity of 100 to 10,000,000 centipoise at 25° C. and intimately dispersed therein

(ii) a discontinuous phase consisting essentially of finely divided solid particles of an ungrafted polymer prepared from an organic monomer having aliphatic unsaturation or a mixture of such monomers polymerized in the presence of said linear fluid poly(diorganosiloxane);

(B) a crosslinking agent selected from the group consisting of (1) a monomeric organosilicate corresponding to the formula:

$$(R^3O)_3SiR^4$$

wherein R^3 is a radical selected from the group consisting of a monovalent hydrocarbon radical, a halogenated monovalent hydrocarbon radical and a cyanoalkyl radical, and R^4 is selected from the group consisting of alkyl, haloalkyl, arylhaloalkyl, alkenyl, cycloalkyl, cycloalkenyl, cyanoalkyl, alkoxy and aryloxy and (2) a partial liquid hydrolysis product of the aforementioned organo silicates; and

(C) a crosslinking catalyst.

4,138,388

METHOD FOR PRODUCING A MOLDING COMPOUND

Gunther Pennekamp, Vreden, Fed. Rep. of Germany, assignor to Firma Pennekamp & Huesker KG, Vreden, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 899,737

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745339

Int. Cl.[2] C08K *7/20*

U.S. Cl. 260—42.46 **11 Claims**

1. In the method for producing a molding compound for the manufacture of plastic parts of high resistance to wear, in which high-molecular low-pressure polyethylene is mixed with cadmium salt and titanium dioxide as additives and then hot-pressed the improvement comprising mixing particles of low-pressure polyethylene and additives comprising particles of a cadmium salt and titanium dioxide, then rapidly heating the mixture to a temperature at which plasticizing commences on the surface of the individual polyethylene particles, at that time adding glass micro-beads to the mixture, then heating the mixture under pressure to the plasticizing temperature and thereafter cooling the mixture.

4,138,389

POLYMERIC ANTIOXIDANTS

Douglas C. Edwards, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Jul. 25, 1974, Ser. No. 491,640

Claims priority, application Canada, Nov. 8, 1973, 185314

Int. Cl.[2] C08L *9/00*

U.S. Cl. 260—45.7 R **9 Claims**

1. A vulcanizable polymeric composition comprising a mixture of at least two compatible polymers, a first polymer being a conjugated diolefin polymer of molecular weight from about 1,500 to about 35,000 and being the reaction product of a reactive polymer containing chemically bound to the polymer a multiplicity of chemically reactive groups selected from olefinic carbon-carbon double bonds, aldehyde, carboxyl, hydroxy, halogen and mixtures thereof, with one or more antioxidant functional group containing compounds of form BX, where B is a functional group selected from amine, alkali metal, hydroxyl, aldehyde and mixtures thereof and capable of reacting with said chemically reactive groups, and X is an antioxidant functional group selected from diphenylamines, phenylene diamines, phenyl naphthylamines, hindered phenols and triphenyl phosphite, said antioxidant functional groups forming from about 20 to about 45 weight percent of said first polymer and said first polymer forming from about 5 to about 20 weight percent based on polymeric components of said mixture, the second polymer being at least one rubbery polymer having a molecular weight of about 150,000 to about 500,000 and being selected from polymers of conjugated diolefins, copolymers of conjugated diolefins with vinyl or vinylidene aromatic compounds, copolymers of conjugated diolefins and olefinically unsaturated nitrile compounds, copolymers of isoolefins and diolefins, alpha-mono-olefin copolymers or blends thereof, said first polymer being vulcanizable with said second polymer.

4,138,390

VINYL RESIN COATING COMPOSITIONS COMPRISING DICYCLOPENTENYL ACRYLATE AND/OR METHACRYLATE VEHICULAR COMPONENT

William D. Emmons, Huntingdon Valley; Kayson Nyi, Sellersville, and Peter R. Sperry, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 687,067, May 17, 1976. This application Dec. 15, 1977, Ser. No. 860,664

Int. Cl.[2] C08K *5/33;* **C08L** *31/02*

U.S. Cl. 260—45.9 L **15 Claims**

1. An autoxidizable coating composition comprising:

(a) A film-forming polymeric binder having a molecular weight in the range of 20,000 to 350,000 viscosity average selected from the group consisting of:

(1) Thermoplastic vinyl addition polymers of one or more monomers consisting of monoethylenically unsaturated monomers having a single unsaturated group of the formula $H_2C{=}C<$,

(2) Polyvinyl acetals obtained from an aliphatic (C_2–C_4) aldehyde, and

(3) Chlorinated polyisoprene containing about 64–65% by weight of chlorine;

(b) A liquid non-volatile reactive monomer selected from the group consisting of:

(A) At least one of dicyclopentenyl acrylate or dicyclopentenyl methacrylate, and

(B) Blends of at least one of dicyclopentenyl acrylate or dicyclopentenyl methacrylate and at least one compound selected from the group consisting of

(1) Higher aliphatic (C_{10}–C_{20}) alcohol esters of (meth)acrylic acid,

(2) Di(C_4–C_8)alkyl fumarates, maleates, and itaconates, and

(3) Polyethylenically unsaturated monomers;

(c) An effective amount of a polyvalent metal-containing complex or salt that catalyzes the oxidative curing of (a) and (b); and

(d) A volatile oxime stabilizer that is capable of inhibiting the oxidizing action of (c).

4,138,391

ACRYLONITRILE-CAPPED POLYETHER-SILOXANES

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 627,251, Oct. 30, 1975, Pat. No. 4,043,951. This application May 19, 1977, Ser. No. 798,610

Int. Cl.[2] C07C *121/34, 121/413, 121/30*

U.S. Cl. 260—465.6 **7 Claims**

1. An acrylonitrile-capped polyoxalkylene compound having the average composition formula

$$R'(OC_3H_6)_n(OC_2H_4)_mOCH_2CH_2CN$$

wherein R′ represents an allyl radical; *m* has a value of from 4 to 30 and *n* has a value of from 0 to 10.

4,138,392

IMIDE NITROGEN DIBENZOFURANS POLYMERS

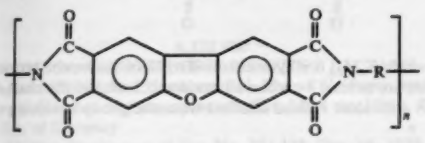
Imre Puskas, Glen Ellyn, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 582,357, May 30, 1975, Pat. No. 4,046,779. This application May 19, 1977, Ser. No. 798,335

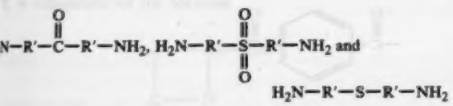
Int. Cl.² C08G *73/10*

U.S. Cl. 528—208 **10 Claims**

1. A composition characterized as a polyimide structurally represented as containing repeating units as follows:



wherein n is from about 10 to about 20,000 and R is the divalent radical of the diamine NH_2RNH_2, the said diamine being selected from the group consisting of $H_2N—R'—NH_2$, $H_2N—R'—O—R'—NH_2$, $H_2N—R'—(CH_2)_{n'}—R'—NH_2$,



wherein n′ is 1 to 20

and R′ is selected from the group consisting of divalent aliphatic hydrocarbon radicals having 2 to 20 carbon atoms, and divalent aromatic radicals selected from the group consisting of phenylene, naphthylene, anthrylene, biphenylene, terphenylene, phenylnaphthylene, and quaterphenylene aromatic radicals.

4,138,393

CROSSLINKABLE ACRYLONITRILE COPOLYMERS

Christian Lindner, Cologne; Carlhans Suling, Odenthal; Günter Arend, Dormagen; Dieter Brokmeier, Dormagen, and Günther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1977, Ser. No. 804,856

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1976, 2626174

Int. Cl.² C08G *2/00, 2/26;* C08F *22/20*

U.S. Cl. 526—287 **3 Claims**

1. A copolymer prepared by free radical polymerization comprising at least 40% by weight of copolymerised acrylonitrile and from 0.5 to 10% by weight of at least one copolymerised unsaturated ester of acetoacetic acid corresponding to the general formula:

$$CH_3—CO—CH_2—COO—R—CR'=CH_2,$$

in which

R represents an alkylene radical with from 1 to 4 carbon atoms, and

R′ represents a hydrogen atom, an alkyl radical with 1 or 2 carbon atoms or the radical

$$CH_3—CO—CH_2—COO—CH_2;$$

0–10% by weight of at least one comonomer selected from the group consisting of acrylic acid and methacrylic acid alkyl ester; and 0–3% by weight of methallyl sulfonic, vinyl sulfonic acid, or styrene sulfonic acid.

4,138,394

PEPTIDE DERIVATIVES AND A METHOD OF MEASURING COLLAGENASE ACTIVITY

Shumpei Sakakibara, Suita; Yutaka Nagai, Koshigaya; Kenji Fujiwara, and Takahiro Sakai, both of Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 761,020

Claims priority, application Japan, Jan. 24, 1976, 51-6926; Aug. 30, 1976, 51-103505; Aug. 30, 1976, 51-103506

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 R **16 Claims**

1. A peptide derivative having the structure

A-Pro-B-Gly-C-Ala-Gly-E

or

A-B-Gly-C-Ala-Gly-E

where A is a hydrophobic, and neutral or acidic chromophore selected from the group consisting of 2, 4-dinitrophenyl, 5-dimethyl-amino-1-naphthalenesulfonyl, p-phenylazobenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-(4-hydroxy-1-naphthylazo)benzenesulfonyl and p-phenylazobenzoyl, B is a residue of an alpha-amino acid having up to 15 carbon atoms occurring in protein, C is Ile or Leu, E is Gln-D-Arg-OH- or D-Arg-OH, and all amino acid residues except for Gly are L-configuration unless otherwise stated.

4,138,395

WATER SOLUBLE COPPER COMPLEX MONOAZO DYESTUFF BASED UPON ORTHO-AMINO PHENOL-SULFONIC ACID AND N-ACETOACETYL COMPOUND OF AMINO-BENZENE-β-HYDROXY-ETHYLSULFONE-SULFURIC ACID ESTER

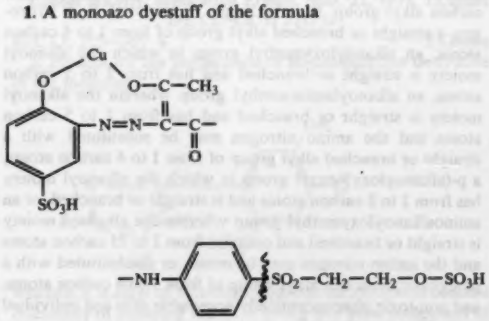
Johann Wenghoefer, East Greenwich, and Dennis G. Messier, West Greenwich, both of R.I., assignors to American Hoechst Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 645,874, Dec. 31, 1975, abandoned. This application May 19, 1977, Ser. No. 798,495

Int. Cl.² C09B *45/18, 62/74;* D06P *1/38, 3/04*

U.S. Cl. 260—149 **1 Claim**

1. A monoazo dyestuff of the formula

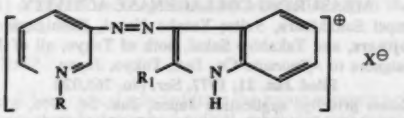


4,138,396
PYRIDYL-AZO-INDOLYL CATIONIC DYES

Stefan Koller, Ramlinsburg, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 644,771, Dec. 29, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,656
Claims priority, application Switzerland, Jan. 3, 1975, 20/75
Int. Cl.[2] C09B 29/06
U.S. Cl. 260—156 1 Claim

1. Cationic azo dyes of formula



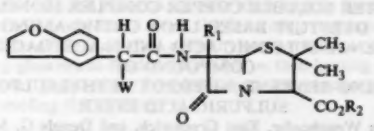
wherein R represents methyl, benzyl or an alkyl radical of 2 to 3 carbon atoms which is unsubstituted or substituted by hydroxyl, cyano, carbamoyl or low molecular carbalkoxy, R_1 represents methyl or phenyl, and $X^{\ominus}$ is the charge equivalent of an anion.

4,138,397
6-(2,3-DIHYDRO-5-BENZOFURANYL)ACETAMIDO PENICILLIN DERIVATIVES

Ekkehard H. Bohme, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed Feb. 27, 1978, Ser. No. 881,610
Int. Cl.[2] C07D 499/68, 499/58, 499/60, 499/62
U.S. Cl. 260—239.1 12 Claims

1. A compound selected from the formula



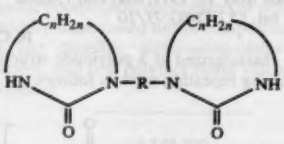
wherein W is hydrogen, —NHR_3, —OH, —CO_2R_4 or —SO_3R_4 wherein R_3 is hydrogen, a straight or branched 2 to 5 carbon alkanoyl group, an alkoxycarbonyl group in which the alkoxy group is straight or branched and contains 1 to 4 carbon atoms; R_4 is hydrogen, a straight or branched 1 to 4 carbon alkyl group; R_1 is hydrogen or methoxy; R_2 is hydrogen, a straight or branched alkyl group of from 1 to 4 carbon atoms, an alkanoyloxymethyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms, an alkanoylaminomethyl group wherein the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms and the amino nitrogen may be substituted with a straight or branched alkyl group of from 1 to 4 carbon atoms, a p-(alkanoyloxy)benzyl group in which the alkanoyl moiety has from 2 to 5 carbon atoms and is straight or branched, or an aminoalkanoyloxymethyl group wherein the alkanoyl moiety is straight or branched and contains from 2 to 15 carbon atoms and the amino nitrogen may be mono- or disubstituted with a straight or branched alkyl group of from 1 to 4 carbon atoms; and non-toxic pharmaceutically acceptable salts and individual optical isomers thereof.

4,138,398
BIS-CYCLIC UREAS

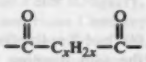
Reinhard H. Richter, North Haven; Benjamin W. Tucker, Bethany, and Henri Ulrich, Northford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 754,189, Dec. 27, 1976, abandoned. This application Feb. 1, 1978, Ser. No. 874,402
Int. Cl.[2] C07D 243/04, 245/02
U.S. Cl. 260—239.3 R 5 Claims

1. A bis cyclic urea having the formula

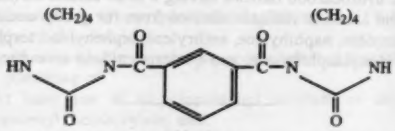


wherein C_nH_{2n} is alkylene from 4 to 12 inclusive and provided there are at least 4 carbon atoms in succession in the chain and R is a divalent radical selected from the group consisting of



wherein C_xH_{2x} is alkylene from 1 to 8 inclusive, and

5. A bis cyclic urea according to claim 4 having the formula

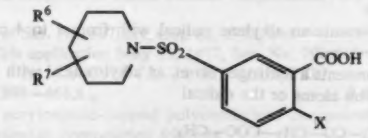


4,138,399
SULFAMYLBENZOIC ACID

Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 713,412, Aug. 11, 1976, which is a division of Ser. No. 481,195, Jun. 20, 1974, Pat. No. 3,992,441, which is a division of Ser. No. 318,213, Dec. 26, 1972, Pat. No. 3,843,662, which is a continuation-in-part of Ser. No. 206,514, Dec. 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 72,156, Sep. 14, 1970, abandoned. This application Jun. 1, 1977, Ser. No. 802,498
Int. Cl.[2] C07D 295/16
U.S. Cl. 260—239.8 14 Claims

1. A compound selected from the group consisting of those of the formula



and the amides, lower alkyl esters and salts thereof with pharmacologically acceptable bases, wherein

X is selected from the group consisting of piperidino, mono- and di-lower-alkylpiperidino, hexamethyleneimino and morpholino;

R^6 is selected from the group consisting of alkyl, alkyloxy and alkyloxyalkyl of one to four carbon atoms in each alkyl group, hydroxy, chloro, bromo, trifluoromethyl, methylene, oxo, phenyl, tolyl, benzyl, benzyloxy, benzyloxymethyl, chloromethyl and hydroxymethyl; and

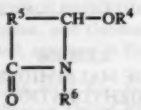
R^7 is selected from the group consisting of hydrogen, alkyl, alkyloxy and alkyloxyalkyl of one to four carbon atoms in each alkyl group, hydroxy, chloro, bromo, trifluoromethyl, phenyl, tolyl, benzyl, benzyloxy, benzyloxymethyl, chloromethyl and hydroxymethyl.

4,138,400
OMEGA-ALKOXY DERIVATIVES OF LACTAMS

Michael Mitzlaff, Bad Homburg, Fed. Rep. of Germany, assignor to Hoechst Aktiengeselischaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 751,335, Dec. 16, 1976, abandoned. This application Feb. 18, 1977, Ser. No. 770,235
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557765; Nov. 23, 1976, 2653089
Int. Cl.² C07D *223/10*
U.S. Cl. 260—239.3 R 7 Claims

1. A compound of the formula



in which R^4 represents an alkyl radical having from 1 to 4 carbon atoms, R^5 stands for $-(CH_2)_{2-10}-$ and R^6 is a branched alkyl radical having from 3 to 10 carbon atoms with a secondary or tertiary N-α-C atom.

5. A compound according to claim 4 wherein R^5 is $-(CH_2)_4-$.

4,138,401
[3,2-g] PYRANOQUINOLINE DERIVATIVES

Peter R. Hammond, Livermore; Erhard J. Schimitschek, San Diego, and John A. Trias, La Mesa, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1976, Ser. No. 671,236
Int. Cl.² C07D *491/04*
U.S. Cl. 546—89 2 Claims

1. 2-keto-6,7,8,9-tetrahydro-2H-pyrano(3,2-g)-quinoline.

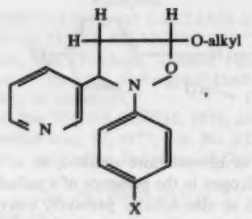
2. 2-keto-9-methyl-6,7,8,9-tetrahydro-2H-pyranol 3,2-g)-quinoline.

4,138,402
3-PYRID-3-YLISOXAZOLIDINE FUNGICIDES

Clive B. C. Boyce, Herne Bay, and Shirley B. Webb, Sheldwich, Faversham, both of England, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 717,803, Aug. 26, 1976, Pat. No. 4,066,770. This application Sep. 6, 1977, Ser. No. 830,953
Int. Cl.² C07D *413/02*
U.S. Cl. 546—275 4 Claims

1. A 3-pyrid-3-ylisoxazolidine of the formula



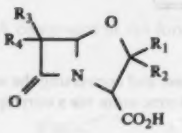
wherein X is chlorine, bromine or fluorine, and "alkyl" is alkyl of from one to six carbon atoms.

4,138,403
AZABICYCLOHEPTANES

Thomas T. Howarth, Ewhurst; Allan G. Brown, Cranleigh; David F. Corbett, Reigate, and Roger J. Ponsford, Westcott Dorking, all of England, assignors to Beecham Group Limited, England

Filed Jul. 26, 1976, Ser. No. 708,343
Claims priority, application United Kingdom, Jul. 29, 1975, 31640/75; Oct. 13, 1975, 41888/75
Int. Cl.² C07D *498/04*
U.S. Cl. 260—307 FA 10 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof wherein

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl, acyl of 1 to 4 carbon atoms, a carboxylic acid group or benzyl ester thereof, or alkyl of 1 to 4 carbon atoms substituted by 1 or 2 halogen atoms;

R_2 is hydrogen;

R_3 is hydrogen; and

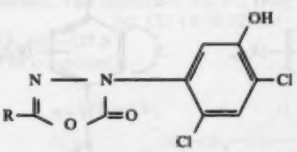
R_4 is hydrogen.

4,138,404
PROCESS FOR THE PREPARATION OF OXADIAZOLINES

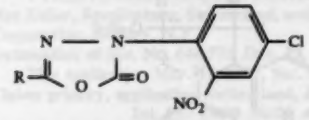
Jean F. Fort, Paris, and Raymond Giraudon, Lesigny Seine-et-Marne, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 453,055, Mar. 20, 1974, abandoned. This application Jul. 1, 1976, Ser. No. 701,580
Claims priority, application France, Mar. 22, 1973, 73.10291
Int. Cl.² C07D *271/10*
U.S. Cl. 260—307 A 2 Claims

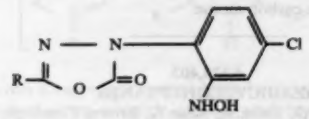
1. Process for the preparation of an oxadiazoline derivative of the formula:



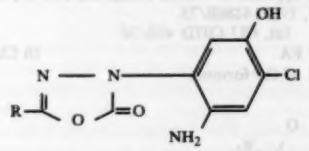
wherein R is alkyl of 1 through 4 carbon atoms, which consists essentially of reducing the nitro group in a nitro compound of the formula:



wherein R is as hereinbefore defined, to a hydroxylamino group with hydrogen in the presence of a palladium catalyst at 15°–25° C. and at atmospheric pressure, converting the hydroxylamine derivative thus obtained of the formula:



wherein R is as hereinbefore defined, by treatment with concentrated sulphuric acid of density 1.83 at a temperature below 25° C., into an aminophenol of the formula:



wherein R is as hereinbefore defined, and converting the amino group in the aminophenol to a chlorine atom via a corresponding diazonium salt.

4,138,405

1-(ARYLAMINO)-AND 1-(ARYLIMINO)PYRROLES

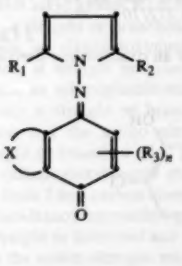
Robert E. Johnson, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 585,448, Jun. 9, 1975, Pat. No. 4,051,147, which is a continuation-in-part of Ser. No. 372,324, Jun. 21, 1973, abandoned. This application Oct. 7, 1976, Ser. No. 730,162

Int. Cl.[2] **A61K** *31/40*; **C07D** *207/50*

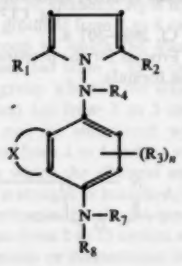
U.S. Cl. 260—326.5 C **18 Claims**

1. A compound having one of the formulas:



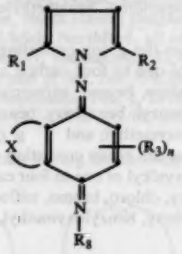
Ib

or



Ic

-continued



Id

where R_1 and R_2 are each hydrogen or each lower-alkyl, or R_1 is hydrogen and R_2 is carboxyl; R_3 is hydrogen, hydroxy, benzyloxy, halo, azido, amino, di-lower-alkylamino or lower-alkyl; R_4 is hydrogen or lower-alkyl; X represents either a benzenoid nucleus fused to the phenyl ring at the positions indicated, or it represents two hydrogen atoms or one hydrogen atom and one of the groups R_3, or two of the groups R_3; R_7 is hydrogen; R_8 is lower-alkyl, phenyl or 1-pyrrolyl, or R_7 and R_8 taken together with the nitrogen atom to which they are attached represent nitroso; n is one of the integers 1 and 2, and where the phenyl ring of the group R_4 when benzoyl or the R_8 group when phenyl can be substituted by lower-alkyl, lower-alkoxy or from one to two halogens.

4,138,406

MANUFACTURE OF MALEIMIDES VIA CYCLIZING DEHYDRATION

Ferenc Balasfalvy, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 558,984, Mar. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 524,686, Nov. 18, 1974, abandoned. This application Jan. 21, 1977, Ser. No. 761,086

Claims priority, application Switzerland, Nov. 22, 1973, 16471/73

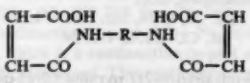
Int. Cl.[2] **C07D** *207/44, 405/14, 403/14, 403/10*

U.S. Cl. 260—326.26 **14 Claims**

1. An improved process for the manufacture of monomaleimides or polymaleimides by cyclising dehydration at temperatures between 40° and 100° C. of a member selected from the group consisting of

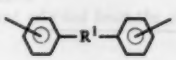
(a) phenyl maleamic acid,

(b) a polymaleamic acid of the general formula



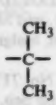
(I)

in which R denotes a radical of the formula



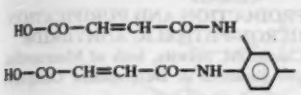
(II)

wherein R^1 represents one of the radicals $—CH_2—$,

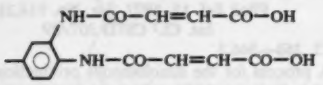


$—SO_2—$ —SO—, —S—, —CO— and —O—,

(c) a polymaleamic acid of the formula

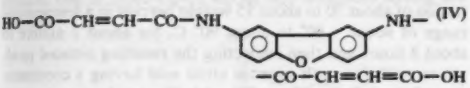


(III)



and

(d) a polymaleamic acid of the formula



(IV)

in the presence of acetic anhydride, a catalyst, and a member selected of the group consisting of trialkylamines and N,N-dialkylbenzylamines with 1 to 12 C atoms in each alkyl group and in the presence or absence of organic solvents, wherein the improvement comprises employing as catalyst a calcium, barium or strontium oxide, acetate or alcoholate in a concentration of 0.005 to 0.2 mol per mol of the monomaleamic or polymaleamic acid.

4,138,407

2,4 PYRROLIDINEDIONES

Frederick Cassidy, Harlow, and Gordon Wootton, Sawbridgeworth, both of England, assignors to Beecham Group Limited, England

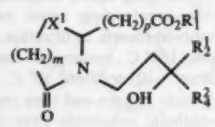
Filed Oct. 15, 1976, Ser. No. 732,726

Claims priority, application United Kingdom, Oct. 25, 1975, 43990/75; May 22, 1976, 21278/76

Int. Cl.[2] C07D *207/40;* **A61K** *31/40*

U.S. Cl. 260—326.33 **2 Claims**

1. A compound of the formula (IV):



(IV)

wherein:

m is 1;

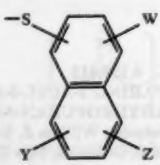
P is 6 or 8;

X^1 is CO;

R_1^1 is hydrogen or C_{1-4} alkyl;

R_2^1 is hydrogen, methyl or ethyl; and

R_4^2 is a group of formula (V):



(V)

wherein:

S is a bond, or a C_{1-6} alkylene group which may be straight or branched by one or two methyl groups at the same or different carbon atoms; and

W, Y and Z are each hydrogen or fluorine, chlorine or bromine atoms, or CF_3, methyl, ethyl, n- or iso-propyl, methoxy, ethoxy, n- or iso-propoxy or nitro; or a salt thereof.

4,138,408

ω-ALKOXY DERIVATIVES OF LACTAMS AND PROCESS FOR THEIR MANUFACTURE

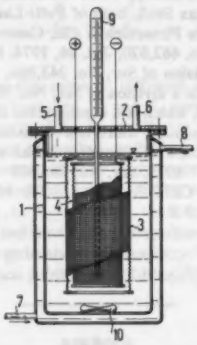
Michael Mitzlaff, Bad Homburg, Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 751,335, Dec. 16, 1976, abandoned. This application Aug. 17, 1977, Ser. No. 825,379

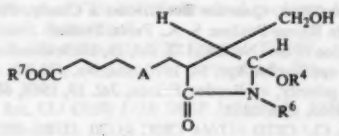
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557765

Int. Cl.[2] C07D *207/26*

U.S. Cl. 260—326.45 **4 Claims**



1. A compound of the formula



in which

A represents —CH≡C—, —CH=CH— or —CH—CH—

R^4 represents an alkyl group having from 1 to 4 carbon atoms,

R^6 represents hydrogen or a branched alkyl group having from 3 to 10 carbon atoms with a secondary or tertiary N-α-C atom, and

R^7 represents an alkyl group having from 1 to 4 carbon atoms, a cycloalkyl group having 5 or 6 carbon atoms or an carbocyclic aralkyl group of 6 to 9 carbon atoms.

4,138,409

EPOXYSULTONE

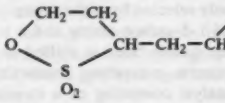
Patricia C. Wang, and Robert E. Wingard, Jr., both of Palo Alto, Calif., assignors to Dynapol, Palo Alto, Calif.

Continuation-in-part of Ser. No. 863,117, Dec. 22, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,622

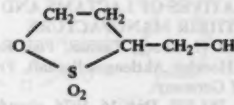
Int. Cl.[2] C07D *327/04*

U.S. Cl. 260—327 S **2 Claims**

1. The compound



2. The compound



4,138,410
FLAVORING AGENT

Max Winter, Petit-Lancy; Fritz Gautschi, Commugny; Ivon Flament, and Max Stoll, both of Petit-Lancy, all of Switzerland, assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 482,820, Jul. 24, 1974, Pat. No. 3,968,264, which is a division of Ser. No. 243,866, Apr. 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sep. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, Apr. 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, Apr. 30, 1965, abandoned. This application May 29, 1975, Ser. No. 581,609

Int. Cl.[2] C07D *333/24, 333/00;* A23L *3/36*

U.S. Cl. 260—332.2 R 3 Claims

1. A thiophene sulfur compound selected from the group of thiophene sulfur compounds consisting of 2-(thienyl-2)-ethanethio and 2-(thienyl-2)-ethanethiol acetate.

4,138,411
PROCESS FOR THE ISOMERIZATION OF AROMATIC ALKENYL COMPOUNDS

Pierre Gandilhon, Quartier Bas-Rivoire a Charly, France, assignor to Rhone-Poulenc S. A., Paris, France

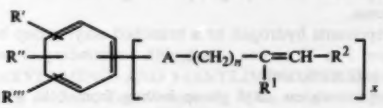
Continuation of Ser. No. 843,173, Jul. 18, 1969, abandoned. This application Apr. 14, 1976, Ser. No. 676,676

Claims priority, application France, Jul. 19, 1968, 68.159950; Feb. 19, 1969, 69.690418

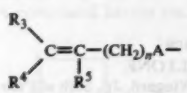
Int. Cl.[2] C07D *317/44;* C07C *43/20, 15/00, 39/02*

U.S. Cl. 260—340.5 R 8 Claims

1. A process for the isomerization of an aromatic alkenyl compound of the formula



wherein R′, R″ and R‴ are independently selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 5 carbon atoms, halogen, amino, hydroxy and a radical of the formula:



wherein R^3 and R^4 are each alkyl of 1 to 5 carbon atoms and R^5 is hydrogen or methyl, and two of R′, R″ and R‴ carried by two adjacent carbon atoms of the aromatic ring can be joined together to form a $—OCH_2O—$ radical, n is an integer from 1 to 10, A is a valence bond, an oxygen atom or an $—NR^6—$ group wherein R^6 is hydrogen or alkyl of 1–5 carbon atoms, R^1 and R^2 are independently selected from the group consisting of hydrogen and alkyl of 1–5 carbon atoms and x is an integer from 1–3, wherein the double bond is shifted nearer to the benzene ring, said process comprising contacting the said compound with a catalyst consisting of a member selected from the group consisting of a ruthenium compound and an osmium compound at a temperature of from 40° to 200° C.

4,138,412
SIMULTANEOUS PRODUCTION AND PURIFICATION OF 4-NITRO-OMICRON-PHTHALIC ANHYDRIDE

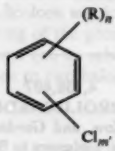
John D. Bacha, and Charles M. Selwitz, both of Monroeville, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 11, 1977, Ser. No. 814,212

Int. Cl.[2] C07D *307/89*

U.S. Cl. 260—346.3 14 Claims

1. A process for the simultaneous production and purification of 4-nitro-o-phthalic anhydride from an impure mixture, said impure mixture having been obtained by subjecting indene, polyindene, dihydronaphthalene or polydihydronaphthalene to nitration with aqueous nitric acid having a concentration of about 70 to about 95 weight percent in a temperature range of about −40° to about 90° C. for about 1 minute to about 8 hours and then subjecting the resulting nitrated product to oxidation with aqueous nitric acid having a concentration of about five to about 50 weight percent in a temperature range of about 135° to about 210° C. for about 0.1 to about 10 hours, which comprises subjecting said impure mixture to azeotropic dehydration in the presence of an azeotroping agent selected from the group consisting of an aromatic compound defined as follows:



wherein R is an alkyl radical having from one to three carbon atoms, *n* is an integer from 0 to 3 and *m* is an integer from 0 to 1 by heating said impure mixture and said azeotroping agent at a temperature of about 135° to about 190° C. and a pressure of about 100 millimeters of mercury to about 100 pounds per square inch gauge for about 0.1 to about ten hours, thereby removing water and azeotroping agent, subjecting the resulting mixture containing azeotroping agent and 4-nitro-o-phthalic anhydride dissolved therein to filtration at a temperature of about 50° to about 160° C., cooling the resulting filtrate to a temperature of about −10° to about 50° C. to crystallize 4-nitro-o-phthalic anhydride therein and then recovering said crystallized 4-nitro-o-phthalic anhydride from said resulting filtrate.

4,138,413
PROCESS FOR PREPARING 2-ACYL-5-SUBSTITUTED THIATETRAHYDROFURAN-4-ONES

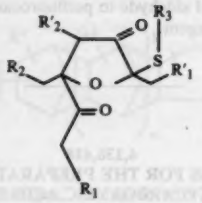
Braja D. Mookherjee, Holmdel; William J. Evers, Middletown, both of N.J., and Alfred E. Goossens, New York, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 819,888, Jul. 28, 1977, Pat. No. 4,092,333. This application Mar. 17, 1978, Ser. No. 887,631

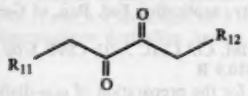
Int. Cl.[2] C07D *307/32*

U.S. Cl. 260—347.2 1 Claim

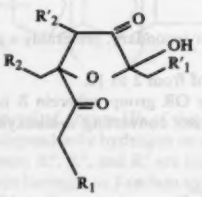
1. A process for preparing at least one member of the genus of 2-acyl-5-substituted thiatetrahydrofuran-4-one compounds defined by the structure:



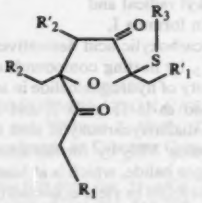
comprising the steps of (i) dimerizing in the presence of a basic material one or more C_4–C_6 alpha, beta diketones having the structure:



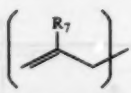
to form one or more alpha, beta diketone dimers defined by the structure:



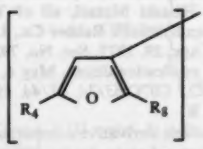
and then, (ii) reacting a mercaptan having the formula R_3SH with said alpha, beta diketone dimer or said alpha, beta diketone dimers in the presence of an acid catalyst thereby producing one or more compounds defined by the structure:



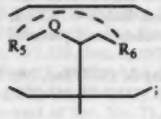
wherein R_1, R_2, R_1' and R_2' are the same or different and each represents hydrogen or methyl and wherein R_3 represents one of C_1–C_9 alkyl, benzyl, phenyl, substituted or unsubstituted allyl having the structure:



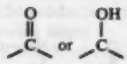
3-furyl substituted or unsubstituted having the structure:



oxy or hydroxy alkyl having the structure:



wherein Q is:



and R_5 and R_6 are the same or different lower alkyl taken separately or, taken together, R_5 and R_6 complete a cyclialkyl ring; and wherein each of R_4, R_7 and R_8 are the same or different and are hydrogen or methyl, and wherein R_{11} and R_{12} are the same or different and each both represent hydrogen or each both represent methyl or one of R_{11} or R_{12} is hydrogen and the other of R_{11} or R_{12} is methyl; the total number of moles of methyl groups and hydrogen groups constituting R_{11} and R_{12} being equivalent to the total number of moles of methyl groups and hydrogen groups constituting R_1, R_2, R_1' and R_2'.

4,138,414

2-PHENOXY AND 2-PHENYLTHIO ANTHRAQUINONE DISPERSE DYES

Werner Baumann, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

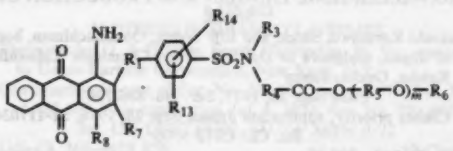
Filed Feb. 22, 1977, Ser. No. 770,920

Claims priority, application Switzerland, Feb. 26, 1976, 2371/76

Int. Cl.[2] **C09B** *1/36;* **D06P** *1/18, 3/48, 3/54*

U.S. Cl. 260—372 **22 Claims**

1. A compound of the formula,



in which R_1 is —O— or —S—,

R_3 is hydrogen; (C_{1-6})alkyl; (C_{1-3})alkyl monosubstituted by hydroxyl, cyano, (C_{1-2})-alkylcarbonyloxy, (C_{1-2})alkoxycarbonyl or (C_{1-2})alkoxycarbonyloxy; (C_{2-6})alkenyl; phenyl; or tolyl;

R_4 is $—(CH_2)_n—$ or —CH(R_{10})—,

R_5 is (C_{2-6})alkylene; $—R_{11}—O—R_{12}—$or $—CH_2CH_2—O—CH_2CH_2—O—CH_2CH_2—$,

R_6 is (C_{1-12})alkyl; (C_{1-6})alkyl monosubstituted by chlorine, bromine or hydroxyl; unsubstituted phenyl (C_{1-2})alkyl, (C_{5-7})-cycloalkyl or phenyl; or phenyl (C_{1-2})-alkyl or phenyl in which the phenyl ring is monosubstituted by chlorine, bromine or methyl,

R_7 is hydrogen, chlorine or bromine,

R_8 is hydroxyl or $—NHR_9$,

R_9 is hydrogen, (C_{1-6})alkyl, (C_{5-7})cycloalkyl or phenyl,

R_{10} is (C_{1-6})alkyl or phenyl,

each of R_{11} and R_{12}, independently, is (C_{2-6})alkylene,

either, R_{13} and R_{14} are both hydrogen, chlorine or bromine, or one of R_{13} and R_{14} is hydrogen and the other is methyl or (C_{1-2})alkoxy,

m is 0 or 1, and

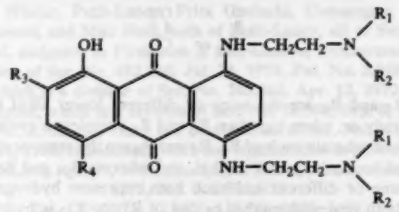
n is 1, 2, 3, 4 or 5.

4,138,415
1,4-BIS(AMINOALKYLAMINO)-ANTHRAQUINONES AND LEUCO DERIVATIVES THEREOF

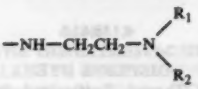
Keith C. Murdock, and Ralph G. Child, both of Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 5, 1978, Ser. No. 903,292
Int. Cl.[2] C07C 97/26; C09B 1/515
U.S. Cl. 260—378 **6 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1 and R_2 are each individually selected from the group consisting of hydrogen, methyl, ethyl and 2-hydroxyethyl; R_3 is hydrogen or hydroxy; R_4 is hydrogen or a moiety of the formula:



wherein R_1 and R_2 are as hereinabove defined with the proviso that one of R_3 and R_4 must be hydrogen but R_3 and R_4 may not both be hydrogen; and the pharmacologically acceptable acid-addition salts thereof.

4,138,416
NON-ALLERGENIC LANOLIN AND PRODUCTION OF SAME

Takeshi Koresawa, Shiga, and Eiji Yoden, Oomihachiman, both of Japan, assignors to Dai-Ichi Croda Chemicals Kabushiki Kaisha, Osaka, Japan

Filed Sep. 26, 1977, Ser. No. 836,794
Claims priority, application Japan, Sep. 28, 1976, 51-117034
Int. Cl.[2] C07J 9/00
U.S. Cl. 260—397.25 **8 Claims**

1. A method for producing non-allergenic lanolin wax which comprises passing a solution of woolgrease or lanolin dissolved in a non-polar solvent selected from the group consisting of aliphatic and aromatic hydrocarbons, chlorinated hydrocarbons and mixtures thereof through a column of an adsorption medium for free fatty alcohols, eluting the column with said non-polar solvent, and evaporating the passed solution and the eluate.

4,138,417
PROCESS FOR PRODUCING PERFLUOROCARBOXYLIC ACID

Hiroshi Ukihashi, Tokyo; Takao Hayashi, and Yukio Takasaki, both of Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 641,640, Dec. 17, 1975, abandoned. This application May 3, 1977, Ser. No. 793,303
Int. Cl.[2] C09F 7/02; C11C 3/00
U.S. Cl. 260—406 **7 Claims**

1. A process of producing a perfluorocarboxylic acid, which comprises:

reacting a perfluoroalkyl olefin with an ozone containing gas having an ozone content of 1 – 10 volume percent to produce a perfluoroalkyl ozonide and perfluoroalkyl aldehyde and converting said perfluoroalkyl ozonide and perfluoroalkyl aldehyde to perfluorocarboxylic acid with an oxidizing agent.

4,138,418
PROCESS FOR THE PREPARATION OF ω,ω-DIALKOXYCARBOXYLIC ACID DERIVATIVES

Klaus Warning, Liederbach, and Michael Mitzlaff, Bad Homburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,940
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2709995
Int. Cl.[2] C11C 3/02; C09F 5/00
U.S. Cl. 260—410.9 R **4 Claims**

1. A process for the preparation of ω,ω-dialkoxycarboxylic acid derivatives of the formula

$$(RO)_2CH(C_nH_{2n})—COX \quad (I)$$

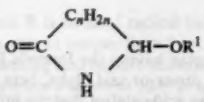
in which

R is a primary or secondary, preferably a primary, C_{1-4} alkyl radical,

n is an integer of from 2 to 10,

X is the NH_2 or OR group, wherein R is defined as above

which comprises converting ω-alkoxylactams of the formula



(II)

in which R^1 is a primary or secondary, preferably a primary, C_{1-4} alkyl radical and

n is defined as in formula I,

into ω,ω-dialkoxycarboxylic acid derivatives of the formula I with X being NH_2, by heating compounds of formula II with a catalytical quantity of hydrogen halide in an alcohol ROH, in which R is defined as in formula I, and optionally further reacting said ω,ω-dialkoxycarboxylic acid derivatives of formula I with X being NH_2 by further heating them with a quantity of hydrogen halide, which is at least about equimolar, in the same alcohol ROH to yield ω,ω-dialkoxycarboxylic acid derivatives of the formula I with X being OR.

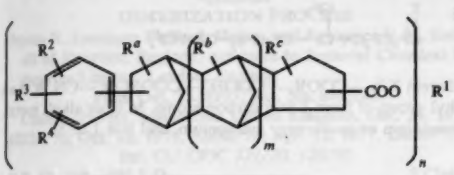
2. Process as claimed in claim 1, which comprises directly converting the ω-alkoxylactams of the formula II into ω,ω-dialkoxycarboxylic acid derivatives of the formula I with X being OR by heating them with a quantity of hydrogen halide at least about equimolar, in an alcohol ROH.

4,138,419
CYCLOPENTADIENE DERIVATIVE

Masatoshi Arakawa; Ryotaro Ohno; Katuhiro Ishikawa; Noboru Yamahara, and Hisashi Matsui, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

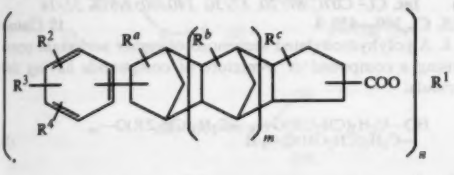
Filed Apr. 29, 1977, Ser. No. 792,225
Claims priority, application Japan, May 6, 1976, 51-50908
Int. Cl.[2] C07C 63/36, 63/44, 69/76
U.S. Cl. 260—429 R **14 Claims**

1. A cyclopentadiene derivative comparable in performance characteristics to natural rosin, having the general formula:



wherein R^1 is hydrogen, a mono- to tetra-hydric alcohol moiety having 1 to 12 carbon atoms, a metal of Groups Ia, and IIa of the Periodic Table, an ammonium group or an organic amine residue; R^2, R^3, and R^4 are independently hydrogen or alkyl groups having 1 to 6 carbon atoms; R^a, R^b, and R^c are independently hydrogen or alkyl groups having 1 to 3 carbon atoms; m is 0 or 1; and n is an integer of 1 to 4.

14. A cyclopentadiene derivative having the general formula:



wherein R^1 is a metal of Group IIb of the Periodic Table; R^2, R^3, and R^4 are independently hydrogen or alkyl groups having 1 to 6 carbon atoms; R^a, R^b, and R^c are independently hydrogen or alkyl groups having 1 to 3 carbon atoms; m is 0 or 1; and n is an integer of 1 to 4.

4,138,420

HYDROFORMYLATION CATALYSTS

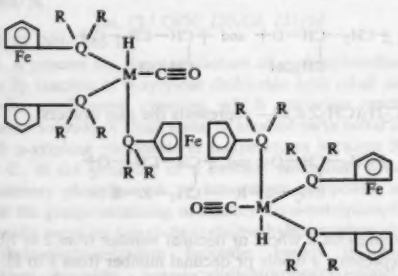
Jerry D. Unruh, and William J. Wells, III, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 650,405, Jan. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 569,738, Apr. 21, 1975. This application Sep. 23, 1977, Ser. No. 836,180

Int. Cl.² C07F *17/02*

U.S. Cl. 260—439 CY **20 Claims**

1. A complex having the structure



wherein M is a Group VIII metal; Q is P, As, or Sb; and R is phenyl or lower alkyl.

4,138,421

PROCESS FOR THE POLYMERIZATION OF ALLYL HALIDES TO PRODUCE POLY(ALLYLSILICOFORMATE) POLYMERS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 757,239, Jan. 6, 1977, which is a division of Ser. No. 622,525, Oct. 15, 1975, which is a continuation-in-part of Ser. No. 551,534, Feb. 21, 1975, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Nov. 9, 1977, Ser. No. 849,853

Int. Cl.² C08F *7/08, 7/18*

U.S. Cl. 260—448.2 E **4 Claims**

1. The process for the production of poly(allyl silicoformate) polymer by the following steps:

(a) mixing 1 part by weight of an alkali compound, 1 part by weight of a silicon acid and 2 parts by weight of an allyl halide;

(b) heating said mixture to 30° to 40° C. while agitating for 20 to 40 minutes under ambient pressure, thereby

(c) producing poly(allyl silicoformate) polymer and salt;

(d) washing said mixture of poly(allyl silicoformate) polymer and salt with water, then filtering off the salt and water, thereby

(e) recovering poly(allyl silicoformate) polymer.

4,138,422

METHOD OF PRODUCING BIOLOGICALLY ACTIVE COMPOSITIONS

John K. Chan, St. Albans; Erich Tobler, Charleston, both of W. Va., and Herbert E. Johnson, Hong Kong, assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 24, 1974, Ser. No. 491,346

Int. Cl.² C07C *69/00;* A01N *9/20*

U.S. Cl. 260—453 RW **28 Claims**

1. In a process for the production of carbamate or urea compositions by the reaction of an organic isocyanate compound and an organic active hydrogen containing compound, the improvement which comprises conducting such reaction in the presence of inert solid granular material.

4,138,423

N-DITHIO CARBAMOYL OXIMES

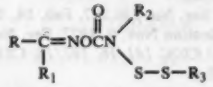
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 486,632, Jul. 8, 1974, Pat. No. 4,080,469. This application Jul. 1, 1976, Ser. No. 701,674

Int. Cl.² C07C *69/02, 121/14;* A01N *9/12*

U.S. Cl. 260—453 RW **19 Claims**

1. Compounds of the formula:



wherein:

R is carbamoyl, lower alkyl, lower alkylthio or lower alkyl substituted with one or more lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, phenylthio, phenylsulfinyl, phenylsulfonyl, lower phenylalkylsulfonyl, lower alkylcarbamoyl, dilower alkylcarbamoyl or $R_4CON(R_5)$-groups all of which groups may be further substituted with one or more chloro, bromo, fluoro, nitro, cyano or amido substituents and the phenyl moieties of said groups may be still further substituted with one or more lower alkyl or lower alkoxy groups;

R_1 is hydrogen, chloro, bromo, fluoro, cyano or a lower alkyl group having from 1 to 4 carbon atoms or a lower alkylthio, lower alkoxy, lower carboalkoxyalkylthio or lower alkylthioalkyl group in which any alkyl moiety may be substituted with one or more chloro, bromo, fluoro, cyano, amido or nitro substituents;

R_2 is lower alkyl or lower alkyl substituted with one or more chloro, bromo, fluoro, nitro or cyano substituents or phenyl or lower phenyl alkyl, either unsubstituted or substituted with one or more chloro, bromo, fluoro, nitro, cyano, lower alkyl or lower alkoxy substituents;

R_3 is alkyl, alkenyl, cycloalkyl, bicycloalkyl, cycloalkenyl, bicycloalkenyl or phenyl or lower phenylalkyl either unsubstituted or substituted with one or more chloro, bromo, fluoro, nitro, cyano, lower alkyl, lower alkoxy or lower haloalkyl substituents;

R_4 and R_5 are individually hydrogen or lower alkyl;

4,138,424
METHOD FOR REMOVING TAR FROM CRUDE TOLYLENE DIISOCYANATE

Yoshihiro Maekawa, Nara, and Masatoshi Matsuura, Hirakata, both of Japan, assignors to Orient Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 13, 1977, Ser. No. 815,295
Int. Cl.² B01D *3/06;* C07C *119/048*
U.S. Cl. 260—453 SP **4 Claims**

1. A method for removing tar material from crude tolylene diisocyanate comprising:

quantitatively feeding a solution consisting of crude tolylene diisocyanate containing tar material or its mixture with an inert organic solvent into the inlet of an elongated heating tube so dimensioned as to have the ratio of its tube length to its inner diameter in a range from about 200 to about 5000 and heated above 230° C., superheating the solution through the elongated heating tube to convert a tolylene diisocyanate of the solution into a superheated vapor in the region of the outlet of the elongated heating tube, spouting the solution thus superheated from the outlet of the heating tube into a separation chamber maintained at a temperature to solidify the tar material while not to condense the vapor of tolylene diisocyanate and under a reduced pressure below 200 torr thereby to obtain a non-tacky and pulverizable tar material substantially freed from the tolylene diisocyanate by the sudden cooling thereof through the adiabatic expansion of a small amount of tolylene vapor contained therein.

4,138,425
METHODS OF PREPARING ANION SURFACE-ACTIVE SUBSTANCES

Nabi A. Khodzhakhanov, ulitsa Samrkand-Darbaza, proezd Termez, 8/62a; Takhir M. Makhmudov, ulitsa Ivleva, 26, and Karim S. Akhmedov, proezd Morozova, 1/8, kv. 17, all of Tashkent, U.S.S.R.

Continuation of Ser. No. 226,307, Feb. 14, 1972, abandoned. This application Nov. 9, 1977, Ser. No. 849,982
Int. Cl.² C07C *141/16, 141/18;* C11D *1/22*
U.S. Cl. 260—458 C **7 Claims**

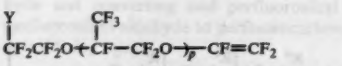
1. Anion surface-active substances having the general formula $R - Ar - (CH_2)_3 - O - SO_3NH_4$, wherein R—Ar is a radical resulting from phenol extracts obtained from the bottoms of petroleum distillation where R is an aliphatic radical having the number of carbon atoms from 9 to 15 and Ar is a mixture of benzene, naphthalene and anthracene radicals.

4,138,426
ALKYL PERFLUORO-ω-FLUOROFORMYL ESTERS AND MONOMERS THEREFROM

David C. England, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 789,724, Apr. 20, 1977. This application Jan. 11, 1978, Ser. No. 868,615
Int. Cl.² C07C *69/52, 69/62, 121/30, 59/27*
U.S. Cl. 260—465.6 **9 Claims**

1. A compound of the formula



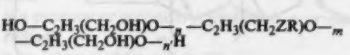
wherein Y is —COOR, —COOH, —COOM or —CN, R is an alkyl group of from 1 to 6 carbon atoms, M is an alkali metal, ammonium or quaternary ammonium, and p is 1 to 5.

4,138,427
SEQUENCED SURFACTANT OLIGOMERS OF THE POLYHYDROXYLATED POLYETHER TYPE, PROCESS FOR PREPARING THEM AND COMPOSITION CONTAINING THEM

Guy Vanlerberghe, Claye-Souilly, and Henri Sebag, Paris, both of France, assignors to L'Oreal, France

Filed Jul. 14, 1977, Ser. No. 815,848
Claims priority, application Luxembourg, Jul. 16, 1976, 75405
Int. Cl.² C07C *87/20, 87/30, 140/00;* A61K *31/14*
U.S. Cl. 260—459 A **10 Claims**

1. A polyhydroxylated sequenced oligomer surfactant comprising a compound or a mixture of compounds having the formula:

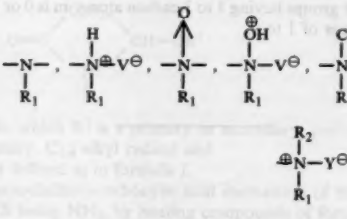


(I)

wherein

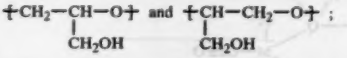
R is linear alkyl having 4–18 carbons atoms;

Z is selected from

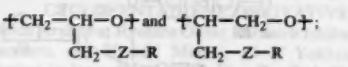


wherein R_1 and R_2 each independently represent methyl, ethyl or hydroxyethyl, Y represents an anion selected from chloride, bromide, iodide, methyl sulfate, methane sulfonate or paratoluene sulfonate, $HR_1N^{\oplus}V^{\ominus}$ and $R_1NO^{\oplus}H.V^{\ominus}$ represents a mineral acid or an organic acid salt of an amine or an amine oxide selected from the hydrochloride, hydrobromide, sulfate, phosphate, acetate, lactate, tartrate, oxalate or succinate thereof, and a represents 0 or 1;

$-C_2H_3(CH_2OH)O-$ represents the two isomers:



$-C_2H_3(CH_2ZR)O-$ represents the two isomers:



m represents a whole or decimal number from 2 to 10;

n represents a whole or decimal number from 2 to 25;

n′ represents 0 or a whole or decimal number from 2 to 25; and

n + n′ represents a whole or decimal number from 2 to 25.

4,138,428

DIMERIZATION PROCESS

James R. Jennings; Philip J. Hogan, and Lawrence F. M. Kelly, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

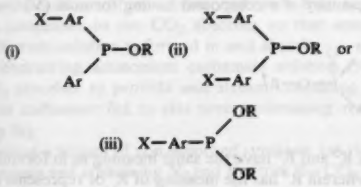
Filed Oct. 13, 1977, Ser. No. 841,924

Claims priority, application United Kingdom, Oct. 21, 1976, 45324/76; Oct. 21, 1976, 52888/76; Apr. 12, 1977, 15029/77

Int. Cl.[2] C07C *121/20, 120/00*

U.S. Cl. 260—465.8 D 9 Claims

1. A process for the dimerisation of acrylonitrile to predominantly 1,4-dicyanobutenes which comprises contacting the acrylonitrile with an organic phosphorus (III) compound, the acrylonitrile being dissolved in an organic solvent capable of donating protons but substantially unreactive with acrylonitrile and the phosphorus (III) compound under the dimerisation conditions, the acrylonitrile and solvent being substantially dry, and the phosphorus (III) compound being one of formula:



where Ar is a phenyl or naphthyl group and where groups X, which may be the same or different, are electron donating substituents of the Ar group in the para or meta positions which give rise to a negative Hammett σ constant and R represents an alkyl or cycloalkyl group having from 1 to 8 carbon atoms, at a temperature in the range 0° to 180° C., the concentrations of acrylonitrile and said organic phosphorus (III) compound being in the range 5 to 75% and 0.01 to 5% by volume, respectively.

4,138,429

PROCESS FOR THE MANUFACTURE OF O-PHENYLENEDIACETONITRILE

Leonardo Guglielmetti, Basel; Alain C. Rochat, Birsfelden, and Ian J. Fletcher, Magden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,083

Claims priority, application Switzerland, Sep. 29, 1976, 12298/76

Int. Cl.[2] C07C *120/04, 121/66*

U.S. Cl. 260—465 H 4 Claims

1. A process for the manufacture of o-phenylenediacetonitrile by reaction of o-xylylene dichloride with alkali metal or alkaline earth metal cyanides, which comprises reacting an aqueous solution of alkali metal or alkaline earth metal cyanide with o-xylylene dichloride at temperatures between 50° and 70° C., in the presence of a cationic emulsifier, which is a quaternary phosphonium or ammonium compound selected from the group consisting of dodecyl tri-n-butylphosphonium bromide, cetyl- or lauryl- benzyldimethylammonium chloride, cetyltrimethylammonium bromide, benzyl tri-n-butylammonium bromide, hexadecyl(dichlorobenzyl)-dimethylammonium chloride, octadecyloxymethyl chloride, hexadecyloxymethylpyridinium chloride or lauryloxymethyl-N-β-hydroxyethylmorpholinium chloride.

4,138,430

PROCESS FOR AMMOXIDATION OF 1-PROPANOL

Alvin B. Stiles, and David C. England, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 639,246, Dec. 9, 1975, abandoned. This application Sep. 28, 1977, Ser. No. 837,632

Int. Cl.[2] C07C *120/00, 120/14, 121/32*

U.S. Cl. 260—465.9 5 Claims

1. A process for the ammoxidation of 1-propanol to form acrylonitrile comprising the steps

(a) forming a vaporous admixture comprising 0.5–5 moles of O_2 and 1–5 moles of NH_3 per mole of 1-propanol; and

(b) contacting the vaporous admixture in rapid sequence with a two-stage catalyst system for a period of from 0.1 to 60 seconds in each stage at a temperature of from 350° to 500° C. and at a pressure of 0.5–6 atm, the catalyst system consisting essentially of

(1) a first bed of dehydration catalyst selected from the group consisting of boron phosphate, coprecipitated SiO_2/Al_2O_3 and coprecipitated WO_3/Al_2O_3; and

(2) a second bed of oxidation catalyst selected from the group consisting of mixed oxides of Fe, Co, Ni, Bi, P, Mo and K, mixed oxides of Fe, Co, W, Bi, Mo and Mg, mixed oxides of Sb and U, bismuth molybdate, busmuth phosphomolybdate, and mixtures of such catalysts.

4,138,431

REACTION OF α-PHOSPHORUS CONTAINING CARBOXYLIC ACIDS WITH PHOSPHOROUS ACID TO PREPARE SCALE AND CORROSION INHIBITORS

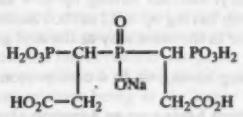
Donald G. Ries, Richmond, and Joseph P. Maniscalco, Sugar Land, both of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jun. 29, 1978, Ser. No. 920,615

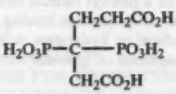
Int. Cl.[2] C07F *9/38;* C23F *11/00;* C09D *5/08;* C02B *5/06*

U.S. Cl. 260—502.4 P 4 Claims

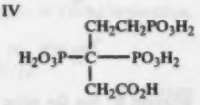
1. A compound selected from one member of the group consisting of



II



IV



VI

and alkali metal and ammonium salts thereof.

4,138,432

AMIDES OF PHOSPHONOACETIC ACID

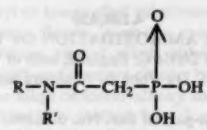
Anne M. Von Esch, North Chicago, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 721,611, Sep. 8, 1976, Pat. No. 4,087,522. This application Apr. 24, 1978, Ser. No. 899,766

Int. Cl.[2] C07F *9/38;* A61K *31/185*

U.S. Cl. 260—502.5 9 Claims

1. An amide of phosphonoacetic acid of the formula



wherein R is C_2–C_{10} alkyl, C_3–C_8 cycloalkyl, benzyl, or adamantyl; and R' is H or C_2–C_{10} alkyl, or its inorganic salts.

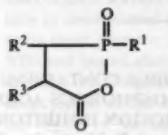
4,138,433

PROCESS FOR PREPARING 1,2-OXA-PHOSPHOLANES

Hans-Jerg Kleiner, Kronberg and Manfred Finke, Fischbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 699,256, Jun. 24, 1976, abandoned.
This application Sep. 29, 1977, Ser. No. 837,887
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1975, 2528420
Int. Cl.² C07F 9/15
U.S. Cl. 260—545 P **12 Claims**

1. Process for preparing 2,5-dioxo-1,2-oxa-phospholanes having general formula (I)

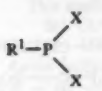


(I)

wherein R^1 represents an alkyl group or a substituted alkyl group having up to 18 carbon atoms, a cycloalkyl group having up to 8 carbon atoms, an alkenyl group having up to 8 carbon atoms, an aryl group having up to 14 carbon atoms, which may be substituted by lower alkyl groups having up to 4 carbon atoms, by lower alkoxy groups having up to 4 carbon atoms, halogen or by amino groups alkylated or dialkylated by lower alkyl radicals having up to 4 carbon atoms, or an aralkyl group having up to 15 carbon atoms and which may be substituted in the same way as the aryl group, wherein

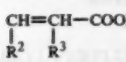
R^2 stands for an alkyl group having up to 4 carbon atoms, or hydrogen and wherein

R^3 stands for an alkyl radical having up to 4 carbon atoms, a phenyl radical or a phenyl radical being substituted by halogen or by lower alkyl groups having up to 4 carbon atoms, for a benzyl radical or hydrogen, which comprises reacting dihalogenophosphines of general formula (II)



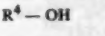
(II)

wherein R^1 has the same meaning as in formula (I) and wherein X stands for chlorine or bromine, with an equimolar quantity of an α,β-unsaturated acid of formula (III)



(III)

wherein R^2 and R^3 have the same meaning as in formula (I), and simultaneously, with an equivalent quantity of a compound of formula (IV),



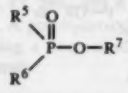
(IV)

wherein R^4 represents hydrogen or an acyl radical substituted by a hydroxy group in α- or β-position or which may be substituted once, twice or three times by halogen, or by a carboxyl group, or wherein R^4 represents the radical —CO—COOH, an alkyl-sulfonyl radical, a phenyl-sulfonyl radical, a phenalkyl-sulfonyl radical or an alkylphenyl-sulfonyl radical having up to 12 carbon atoms, or wherein R^4 represents a radical of formula (IVa),

(IVa)

wherein R^5 represents an alkyl radical having up to 12 carbon atoms which may be substituted by halogen, a cycloalkyl radical having up to 8 carbon atoms or an alkenyl radical having from 2 to 12 carbon atoms,

and wherein R^6 has the same meaning as specified for R^5 or stands for a carboxylic acid group having from 2 to 4 carbon atoms or $HO(CH_2)_3$— or $HO(CH_2)_4$—, or with an equivalent quantity of a compound having formula (V)



(V)

wherein R^5 and R^6 have the same meaning as in formula (IVa) and wherein R^7 has the meaning of R^5 or represents a group of formula (IVa),

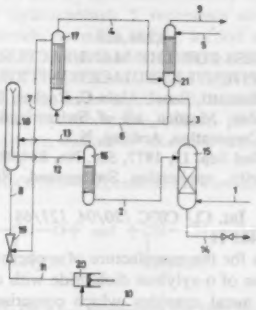
or with an equivalent quantity of mixtures of the compounds having formulae (IV) and (V) and isolating the reaction products.

4,138,434

INTEGRATED AMMONIA-UREA PRODUCING PROCESS, FOR THE PRODUCTION OF UREA

Vincenzo Lagana, Milan, and Francesco Saviano, Segrate (Milan), both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Dec. 2, 1977, Ser. No. 857,185
Claims priority, application Italy, Dec. 23, 1976, 30797 A/76
Int. Cl.² C07C 126/02
U.S. Cl. 260—555 A **4 Claims**



1. An integrated process for the production of urea which comprises carrying out in a urea synthesis section the steps of:

(a) feeding a stream of anhydrous ammonia and/or ammonia in aqueous solution and a stream containing ammonium carbamate to a urea-synthesizing reactor so that urea is synthesized therein;

(b) withdrawing a solution of urea containing ammonium carbamate from the urea-synthesizing reactor and feeding said stream to a decomposer wherein about 50% of said

ammonium carbamate is decomposed providing ammonia and carbon dioxide;

(c) recycling gaseous ammonia and carbon dioxide from said decomposer to the urea-synthesizing reactor;

(d) withdrawing a solution of urea containing the balance of said ammonium carbamate and enriched with ammonia from said decomposer;

(e) feeding said solution withdrawn from the decomposer in step (d) to an adiabatic stripping column;

(f) feeding a stream of stripping gas consisting of raw ammonia synthesis gases and composed essentially of CO_2, N_2 and H_2 to said stripping column whereby said urea solution is purified and said stripping gas stream is enriched with NH_3, H_2O and CO_2;

(g) recovering purified urea solution from said stripping column;

(h) feeding said enriched stripping gas stream from the stripping column to a CO_2 absorber;

(i) feeding an absorbing liquid comprised of an ammoniacal aqueous solution of ammonium carbonate from an ammonia condenser to the CO_2 absorber so that ammonium carbamate solution is formed in said absorber;

(j) withdrawing ammonium carbamate solution from the CO_2 absorber to provide said stream containing ammonium carbamate fed to said urea synthesizing reactor in step (a);

(k) feeding a stream of non-absorbed synthesis gas rich with ammonia and containing N_2 and H_2 from the CO_2 absorbing column to said ammonia condenser;

(l) feeding an aqueous solution of ammonium carbonate to the ammonia condenser so that the aqueous solution of ammonium carbonate fed to the CO_2 absorber in step (i) is produced; and

(m) recovering N_2 and H_2 from said ammonia condenser for transmission to an ammonia synthesis section.

4,138,435

DETERGENT COMPOSITION

William P. Evans, Wirral, and Appayya R. Naik, Birkenhead, both of England, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 637,249, Dec. 3, 1976, Pat. No. 4,020,100, which is a continuation of Ser. No. 396,933, Sep. 13, 1973, abandoned. This application Dec. 27, 1976, Ser. No. 754,720

Int. Cl.[2] C07C *87/30*

U.S. Cl. 260—567.6 M **1 Claim**

1. N-(dodecyl-hydroxybenzyl)-N,N,N-trimethylammonium iodide.

4,138,436

PROCESS FOR PRODUCING 3,5-DICHLOROANILINE FROM 1-BROMO-2,4-DICHLOROBENZENE

Ryuzo Nishiyama, Takatsuki; Kanichi Fujikawa, Kyoto; Isao Yokomichi, Kusatsu; Yasuhiro Tsujii, Kusatsu; Kuniaki Nagatani, Kusatsu, and Shigeyuki Nishimura, Shiga, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Filed Jul. 27, 1977, Ser. No. 819,389

Claims priority, application Japan, Aug. 5, 1976, 51-93681

Int. Cl.[2] C07C *85/04*

U.S. Cl. 260—581 **3 Claims**

1. A process for producing 3,5-dichloroaniline which comprises reacting 1-bromo-2,4-dichlorobenzene with a specific metal amide selected from the group consisting of lithium amide, sodium amide and potassium amide in liquid ammonia, wherein said 1-bromo-2,4-dichlorobenzene is reacted with said specific metal amide at a molar ratio of 1-bromo-2,4-dichlorobenzene to the specific metal amide of 1 : 2 to 7.

4,138,437

PROCESS FOR THE PREPARATION OF TERTIARY ALIPHATIC AMINES

Julius Strauss, Altötting; Herbert Hübner, Burgkirchen, Alz; Heinz Müller, Burgkirchen, Alz, and Engelbert Krempl, Burgkirchen, Alz, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

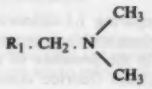
Continuation-in-part of Ser. No. 711,720, Aug. 5, 1976, abandoned. This application Apr. 26, 1977, Ser. No. 790,897

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1975, 2535073

Int. Cl.[2] C07C *85/06, 85/08*

U.S. Cl. 260—583 R **5 Claims**

1. In a process for the preparation of tertiary amines of the formula



wherein

R_1 is an alkyl or alkenyl radical having from 7 to 23 carbon atoms, by reacting a liquid reactant selected from the group consisting of alcohols of the formula

$$R_1 \cdot CH_2 \cdot OH,$$

aldehydes the the formula

wherein R_1 is a defined above, and mixtures thereof, with a circulating gaseous mixture containing hydrogen and dimethylamine as starting amine at pressure of up to 5 atmospheres and at temperatures of 160° to 230° C., stripping off the water formed in the reaction by means of said circulating gaseous mixture and removing said water from said gaseous mixture, and recirculating said gaseous mixture into said liquid reactant, wherein the improvement comprises carrying out the reaction with a proportion of the starting amine in said circulating gaseous mixture being in the range from 1 to 20 percent by volume and in the presence of a copper-chromium oxide catalyst.

4,138,438

PROCESS FOR PRODUCING PENTACHLORONITROBENZENE

Walter A. Gay, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 22, 1977, Ser. No. 826,603

Int. Cl.[2] C07C *79/12*

U.S. Cl. 260—646 **11 Claims**

1. A process for producing pentachloronitrobenzene comprising

(a) mixing together pentachlorobenzene and a mixed nitration acid consisting essentially of sulfuric acid and nitric acid at a temperature in the range from about 100° C. to about 120° C., said nitric acid being in molar excess of said pentachlorobenzene;

(b) heating the resulting reaction mixture to a temperature in the range of about 130° C. to about 140° C. and maintaining said reaction mixture within this temperature range for a period of time which is no longer than is necessary for the conversion of pentachlorobenzene to pentachloronitrobenzene to be substantially complete;

(c) reacting substantially all of the remaining nitric acid in said reaction mixture with HCl;

(d) heating said reaction mixture to a temperature in the range of about 142° C. to about 160° C. to form a melt of pentachloronitrobenzene; and

(e) cooling said reaction mixture to recrystallize the melted pentachloronitrobenzene.

4,138,439

METHOD OF PREPARING 1,1-DIFLUOROETHANE

Neithart Schultz, Eichsel; Hans-Joachim Vahlensieck, Wehr, and Peter Martens, Rheinfelden, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 20, 1976, Ser. No. 734,212

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547182

Int. Cl.² C07C *17/08*

U.S. Cl. 260—653.6 **3 Claims**

1. A process for preparing 1,1-difluoroethane which comprises contacting acetylene with an agent consisting essentially of hydrogen fluoride in the presence of a catalyst consisting essentially of an aluminum fluoride containing catalyst at a temperature between 150° and 250° C. employing a residence time of 1 to 60 seconds, said catalyst being one prepared by imbibing gamma or eta aluminim oxide with a solution of a bismuth salt and a manganese salt, then heating the so-imbibed aluminum oxide at a temperature between 150° and 250° C., initially in a nitrogen atmosphere and then, after complete drying, in a mixture of hydrogen fluoride and increasing the concentration of hydrogen fluoride up to a 100 percent hydrogen fluoride atmosphere, said finished catalyst consisting essentially of:

0.1 to 20 weight percent of bismuth,

0.1 to 10 weight percent of manganese,

20 to 38 weight percent of aluminum,

32 to 60 weight percent of fluorine,

any balance consisting essentially of oxygen.

4,138,440

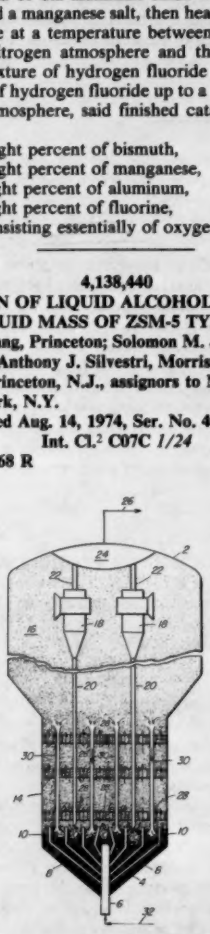
CONVERSION OF LIQUID ALCOHOLS AND ETHERS WITH A FLUID MASS OF ZSM-5 TYPE CATALYST

Clarence D. Chang, Princeton; Solomon M. Jacob, Cherry Hill, both of N.J.; Anthony J. Silvestri, Morrisville, Pa., and John C. Zahner, Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 14, 1974, Ser. No. 497,429

Int. Cl.² C07C *1/24*

U.S. Cl. 260—668 R **5 Claims**



1. A method for converting a chemical reactant selected from the group consisting of methanol, ethanol, ether derivatives of lower alcohols and mixtures of alcohols and ethers to gasoline boiling range constituents with fluidizable catalyst particles comprising a crystalline zeolite having a pore dimension greater than about 5 Angstroms, a silica to alumina ratio of at least 12 and a constraint index within the range of 1 to 12 which comprises,

maintaining said fluidizable catalysts particles flowing from the lower portion of a reaction zone to an upper portion thereof and through a plurality of adjacent and vertically spaced apart confined passageways in said reaction zone, said passageways arranged to promote a continuous upward flow of dispersed reactant, formed product thereof and suspended catalyst particles through the reaction zone, charging chemical reactant to the lower portion of said reaction zone as a plurality of separate streams each in alignment with a lower most confined passageway, recycling a plurality of separate confined catalyst streams from an upper portion of said reaction zone to a lower portion thereof so that recycled catalysts is discharged beneath and adjacent a lower most confined passageway, effecting temperature restraint in the reaction zone not to exceed about 1000° F. and imposing a temperature restraint in the chemical reactant and entrained catalyst in the lower portion of the reaction zone by effecting at least partial vaporization of the chemical reactant upon contact with hot recycled catalysts and thereafter passed upwardly through said confined passageways in said reaction zone.

4,138,441

SYNTHESIS OF SUBSTITUTED CYCLOPENTADIENES AND CYCLOPENTADIENE-FUNCTIONALIZED POLYMERS

Joseph P. Kennedy, 952 Genesee Rd., Akron, Ohio 44303, and Kenneth F. Castner, 2365 Cooledge Ave., Akron, Ohio 44305

Filed Feb. 22, 1977, Ser. No. 770,436

Int. Cl.² C07C *3/50, 13/08*

U.S. Cl. 260—666 A **3 Claims**

1. A method of preparation of hydrocarbon-substituted cyclopentadienes which comprises reacting a compound of the formula $R_x'Al(CPD)_y$ wherein CPD represents the cyclopentadienyl group, R' represents an alkyl, cycloalkyl, alkenyl, cycloalkenyl, alkaryl or aryl group, y equals 1 to 2 and x equals 2 to 1 and the sum of x plus y is equal to 3, with a tertiary, allylic or benzylic halide of the formula RX, wherein R is selected from the group consisting of alkyl, cycloalkyl, alkenyl, cycloalkenyl, alkaryl or aryl, and X represents chlorine, bromine or iodine.

4,138,442

PROCESS FOR THE MANUFACTURE OF GASOLINE

Clarence D. Chang, Princeton, N.J., and Anthony J. Silvestri, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 529,779, Dec. 5, 1974, Pat. No. 4,076,761, which is a continuation of Ser. No. 387,220, Aug. 9, 1973, abandoned. This application Dec. 2, 1977, Ser. No. 856,966

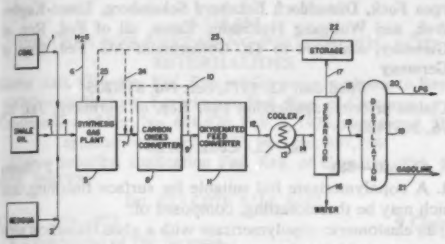
The portion of the term of this patent subsequent to Jul. 8, 1992, has been disclaimed.

Int. Cl.² C07C *18/00*

U.S. Cl. 260—668 R **4 Claims**

1. In the process for manufacture of liquid hydrocarbon fuels boiling in the gasoline boiling range which comprises converting the oil from tar sands in a first reaction to a gaseous mixture in contact with a methanolsynthesis catalyst in a first reaction of hydrogen and carbon oxides and converting said gaseous mixture to normally liquid hydrocarbons and oxygen-substituted hydrocarbons comprising methanol; the improvement comprising the additional step of contacting at least said oxygen-substituted hydrocarbons including said methanol with a catalytically active aluminosilicate zeolite having a silica to alumina ratio of at least about 12, a constraint index of about 1 to 12 and a crystal density, in the hydrogen form, of not sub-

stantially below about 1.6 grams per cubic centimeter at a temperature of about 500° F. to 1000° F., a space velocity of



about 0.1 to 50 liquid hourly space velocity, and a pressure of about 1 to 50 atmospheres; and, recovering liquid hydrocarbons.

4,138,443

HYDRODEALKYLATION OF ALKYLAROMATIC HYDROCARBONS

Jean-Pierre Brunelle, Fresnes, France, assignor to Societe Francaise des Produits pour Catalyse "Procatalyse", Rueil Malmaison, France

Filed Jun. 20, 1977, Ser. No. 808,312
Claims priority, application France, Jun. 22, 1976, 76 18961
Int. Cl.² C07C *3/58*
U.S. Cl. 260—672 R **17 Claims**

1. A process for hydrodealkylating alkyl-substituted aromatic hydrocarbons, which comprises the step of reacting an alkyl-substituted aromatic hydrocarbon, in the absence of water vapor with an amount of hydrogen which is equivalent to a molar ratio between the alkyl-substituted aromatic hydrocarbon and the hydrogen of between about 1:10 to about 1:1, at a temperature of between about 450° and about 650° C., and under a pressure of about 1 to about +bars and a space velocity of between about 1 to about 10 volumes of the liquid per volume of the catalyst, per hour, in the presence of a catalyst which comprises a metal combination of rhodium and at least one metal selected from the group consisting of copper, nickel, cobalt, iron, and zinc, and a support comprising activated alumina selected from the group consisting of agglomerates of active alumina obtained by dehydrating alumina hydrate in a stream of hot gas and agglomerates of active alumina having a gamma tetragonal crystallographical structure obtained by autoclaving agglomerates of active alumina in an acid or neutral aqueous medium said activated alumina having a specific surface of between about 100 and about 350 m^2/g and a total pore volume of from about 0.5 to about 0.8 cm^3/g.

4,138,444

SELF-ALKYLATION OF ISOBUTANE

Sheldon Herbstman, Spring Valley; Edward L. Cole, Fishkill, and John H. Estes, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 3, 1977, Ser. No. 848,186
Int. Cl.² C07C *3/56*
U.S. Cl. 260—683.47 **25 Claims**

1. A process for the self-alkylation of isobutane which consists essentially of contacting isobutane and a C_5 or higher olefin at a temperature between about 75° and 250° F. with a solid catalyst comprising chlorided alumina, wherein the mole ratio of said isobutane to olefin is from about 11:1 to 150:1 and forming isooctane.

4,138,445

FLAME RETARDANT FIBER

Tatsuo Nogi; Yasuo Yoshizawa; Kanzi Kashihara; Nobuo Yoshizumi, and Yoshizo Tsuda, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 575,590, May 8, 1975, abandoned. This application Oct. 25, 1977, Ser. No. 845,336
Claims priority, application Japan, May 21, 1974, 49-56109
Int. Cl.² C08L *61/28, 61/24, 61/34, 29/04*
U.S. Cl. 260—844 **15 Claims**

1. A flame retardant fiber capable of being crosslinked comprising about 80–5% by weight of polyvinyl alcohol having a degree of hydrolysis (mol %) between about 85 and 99.4 and about 20–95% by weight of an amino resin condensate having at least 50% methylene groups, whereby only a small amount of reactive hydroxy methyl groups are present in said amino resin, based on the formulation:

$$Me = \frac{\text{methylene groups in the amino resin (moles)}}{\text{sum of hydroxymethyl and methylene groups in the amino resin (moles)}} \times 100$$

wherein Me represents the methylene groups, said amino resin being the condensate of formaldehyde and an amino compound selected from the group consisting of melamine, cyclohexyl melamine, guanamine, benzoguanamine, acetoguanamine, urea, methylurea and mixtures thereof, in the presence of an acid catalyst.

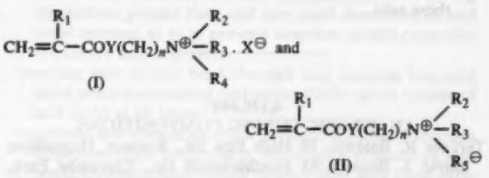
4,138,446

WATER-SOLUBLE HIGH POLYMERS AND THEIR PREPARATION

Shigenao Kawakami, Hirakata; Tatsumi Shibata, Ibaraki; Shin-Ichi Isaoka, Minoo, and Tutomu Shintani, Ohita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 642,185, Dec. 18, 1975, Pat. No. 4,075,183. This application Sep. 30, 1977, Ser. No. 838,052
Claims priority, application Japan, Dec. 19, 1974, 49-146371; Jul. 10, 1975, 50-85060
Int. Cl.² C08F *267/10, 2/00, 4/30, 220/00*
U.S. Cl. 260—875 **10 Claims**

1. In the production of a water-soluble, cationic high polymer of: (A) at least one of acrylamide and methacrylamide and; (B) at least one of the ammonium-type monomers of either one of the formulas:



(I)

(II)

wherein R_1 is a hydrogen atom or a methyl group, R_2 and R_3 are each a lower alkyl group, R_4 is a hydrogen atom, a lower alkyl group, an aryl group, a hydroxy(lower)alkyl group, a benzyl group or a group of the formula:

$$-CH_2COO(CH_2)_mCH_3$$

wherein m is an integer of 0 or 1, $R_5^{\ominus}$ is a group of either one of the formulas:

$$-(CH_2)_2COO^{\ominus} \text{ and } -(CH_2)_3SO_3^{\ominus}$$

, X is a halogen atom or an acid residue, Y is —O— or —NH— and n is an integer of 1 to 4, a process which comprises initiating the polymerization of the monomeric component (A) in an aqueous medium containing an organic solvent selected from the group consisting of acetone, acetonitrile, t-butanol, tetra-

hydrofuran and dioxane at a concentration of about 15 to 70% by weight until the polymerization proceeds to a certain extent and then continuing the polymerization while adding the monomeric component (B) thereto with the occasional supplementation of a water-miscible organic solvent thereto so as to keep an appropriate viscosity of the reaction system to produce the high polymer.

4,138,447

NITROGENOUS POLYMER COMPOSITIONS

Gary L. Deets, Springfield, and Peter Shapras, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 807,870, Jun. 20, 1977, Pat. No. 4,097,552. This application Dec. 5, 1977, Ser. No. 857,345

Int. Cl.[2] C08K *3/06, 3/22, 5/03, 5/06*

U.S. Cl. 260—876 R **6 Claims**

1. A polymer composition comprising a nitrogenous polymer and an halogenated aromatic flame retardant and from 2.5 to 20 percent by weight of an alkaline earth metal oxide and from 2.5 to 20 percent by weight of sulfur, all percentages being based on the polymer weight.

4,138,448

PROCESS FOR PREPARING POLYMERS OF CYCLOPENTADIENE AND BICYCLOHEPTENE MIXTURES

Robert J. Minchak, Parma Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,547

Int. Cl.[2] C08F *4/60, 4/44, 232/08, 297/06*

U.S. Cl. 260—879 **20 Claims**

1. A process for preparing polymers of a monomer mixture of cyclopentadiene and from about 5 to about 95% by weight, based on total polymer weight, of at least one bicycloheptene comprising polymerizing the monomer mixture in the presence of a catalyst mixture comprising

(a) at least one organoaluminum halide of the formula $RAlX_2$ or $R_3Al_2X_3$ wherein R is an alkyl radical containing from 1 to about 12 carbon atoms, and X is a halogen, and

(b) at least one tungsten or molybdenum salt, or a mixture of these salts.

4,138,449

ANAEROBIC CURING COMPOSITIONS

Terence R. Baldwin, 10 High Firs Rd., Romsey, Hampshire; David J. Bennett, 61 Heathermount Dr., Edgcumbe Park, Crowthorne, Berkshire, and William A. Lees, 36 Peverells Rd., Chandlersford, Hampshire, all of England

Continuation of Ser. No. 576,087, May 9, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,180

Claims priority, application United Kingdom, May 13, 1974, 20979/74

Int. Cl.[2] C08F *279/02*

U.S. Cl. 260—879 **9 Claims**

1. In an essentially solventless, liquid anaerobic curing composition, comprising an anaerobically curable monomer component consisting essentially of one or more anaerobically curable acrylate esters, the improvement which comprises incorporating therein from 1-50% by weight, based on the total composition, of a low molecular weight, reactive rubber having at least one group of the formula $—NH_2$, —OC-(O)CR:CH_2, —COOH or —SH in the polymer molecule, where R is H, C_1-C_4 alkyl or halogen.

4,138,450

COPOLYMERIZATE FOIL SUITABLE FOR SURFACE FINISHING

Jürgen Fock, Düsseldorf; Eckehard Schamberg, Essen-Kupferdreh, and Wolfgang Hoffmann, Essen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Fed. Rep. of Germany

Filed Jul. 13, 1977, Ser. No. 815,235

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1976, 2631423

Int. Cl.[2] C08L *33/20*

U.S. Cl. 260—881 **2 Claims**

1. A copolymerizate foil suitable for surface finishing, and which may be thermosetting, composed of:

(A) an elastomeric copolymerizate with a glass transition temperature no higher than + 10° C., obtained by copolymerizing

(a) 70 to 99% by weight of an acrylic acid alkyl ester with 1 to 8 carbon atoms in the alkyl residue,

(b) 1 to 20% by weight of at least one of a hydroxyalkyl ester with 2 to 4 carbon atoms in the alkyl residue, and an acid amide of acrylic or methacrylic acid,

(c) 0 to 20% by weight of at least one of acrylonitrile and methacrylonitrile, and optionally

(d) 0 to 2% by weight of a cross-linking monomer with at least two reactive, non-conjugated double bonds in the molecule, the reactivity of the double bonds possibly varying,

where the sum of a, b, c and d amounts to 100% by weight, acting as the grafting base, onto which is grafted

(B) a hard-brittle copolymerizate obtained by copolymerizing

(a) 10 to 60% by weight of at least one of styrene and one or more methacrylic acid alkyl esters with 1 to 20 carbon atoms in the alkyl residue,

(b) 1 to 10% by weight of an acrylic acid alkyl ester with 1 to 8 carbon atoms in the alkyl residue,

(c) 0 to 20% by weight of an N-methoxymethyl amide of at least one of acrylic acid and methacrylic acid,

(d) 0 to 20% by weight of a hydroxyalkyl ester of acrylic or methacrylic acid with 2 to 4 carbon atoms in the alkyl residue,

(e) 0 to 20% by weight of acrylic or methacrylic acid amide, the molar ratio of component c to the sum of d and e being about 1 : 1 and that of d : e ranging from 4 : 1 to 1 : 4, and optionally

(f) >20 to 75% by weight of at least one of acrylonitrile and methacrylonitrile,

where the sum of components a through f is 100% by weight and where the ratio by weight of the elastomeric copolymerizate A to the hard-brittle copolymerizate B is 1 : 3 to 1 : 20.

4,138,451

PHOSPHONO-ISOCYANO-ACETATES

Jacques Gosteli, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

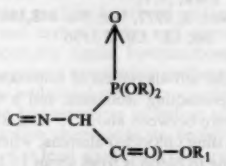
Division of Ser. No. 608,798, Aug. 28, 1975, Pat. No. 4,045,520. This application Apr. 28, 1977, Ser. No. 791,757

Claims priority, application Switzerland, Sep. 11, 1974, 12353/74

Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—940 **3 Claims**

1. A compound of the formula



(IV)

wherein R represents lower alkyl, aryl or aryl-lower alkyl and R_1 represents a radical which protects the carboxyl group.

4,138,452
PROCESS FOR PREPARING PHOSPHORIC ACID ESTERHALIDES

Dieter Arlt, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

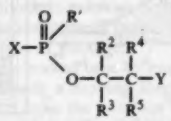
Continuation of Ser. No. 654,670, Feb. 2, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,154

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507779

Int. Cl.[2] C07F *9/14, 9/42*

U.S. Cl. 260—955 9 Claims

1. Compound of the formula



(III)

wherein

X is chlorine or bromine;

Y is chlorine or bromine;

R^1 is C_1–C_8 alkoxy, C_1–C_8 haloalkoxy, fluorine, chlorine or bromine;

R^2 is fluorine;

R^3 is hydrogen, fluorine, chlorine or C_1–C_4 alkyl; and

R^4 and R^5, which may be identical or different, are hydrogen, C_1–C_4 alkyl, or phenyl.

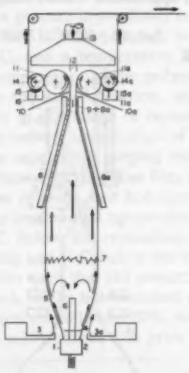
4,138,453
PROCESS FOR MANUFACTURING BLOWN FILM SHEETING

Walter E. Segl, Jr., Orwigsburg, Pa., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 17, 1977, Ser. No. 797,783

Int. Cl.[2] B29F *3/08*

U.S. Cl. 264—22 4 Claims



1. A process for manufacturing thermoplastic film in sheet form utilizing a tubular blowhead apparatus which comprises producing a blow tubular film bubble by extruding said film through an extrusion die, blowing said film with the blowhead positioned adjacent to said extrusion die, the blowhead having internal and external air cooling means below the freeze line of the film, cooling said film bubble with said internal and external air cooling means, conveying the tubular bubble upwardly and collapsing it to a relatively flat cross-sectional tube and, immediately prior to the takeoff mechanism, slitting the opposed edges of the collapsed film with a cutting device to form two sheets of film from the tubing and an aperture between said sheets, the takeoff mechanism comprising a double set of horizontally adjustable takeoff rolls for hauling off the film sheets and controlling the size of the aperture between the film sheets and conveying the internal cooling air out of the tubular bubble through the aperture using air exhaust means positioned above the takeoff rolls.

4,138,454
LOW PROFILE METHOD OF MIXING AND DEPOSITING FOAM

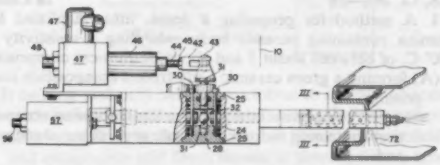
Thomas Harmon, Hamilton, Ohio, and Tracy Keeling, Houston, Tex., assignors to Kornylak Corporation, Hamilton, Ohio

Division of Ser. No. 570,455, Apr. 22, 1975, Pat. No. 4,062,525.

This application Mar. 7, 1977, Ser. No. 775,315

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—39 3 Claims



1. A method of producing a foam product, comprising the steps of:

providing separately two fluid chemicals under pressure that when mixed will produce a foamable mixture;

providing a substantially closed mold having at least a temporary side opening of one fixed small dimension for the insertion of a foam mixing and depositing head;

providing a canti- levered mixing head having therein a mixing chamber with a discharge opening at its outer end, a mechanical mixer within the mixing chamber and a sole support at its inner end, a plurality of automatic pressure responsive valves in fluid communication with said mixing chamber oriented so as to prevent flow through them from said mixing chamber and provide fluid flow through them to said mixing chamber only at pressure differentials across them greater than a fixed pressure;

providing a plurality of controllable valves respectively in fluid communication separately with said automatic valves and being controllable between an open position and a closed position, with said controllable valves having dimensions greater than said one small dimension of said mold opening so as to prevent insertion of said controllable valves into said mold;

inserting said mixing head through said opening into said mold while maintaining said controllable valves outside of said mold at all times;

supplying said chemicals under pressure separately through respective open controllable valves at a pressure to said respective automatic valves greater than said fixed pressure so as to automatically open said automatic valves and pass the chemicals separately into said mixing chamber;

combining the chemicals within said mixing chamber and mechanically mixing them together to produce a foamable mixture and discharging the foamable mixture of mixed chemicals from the discharge opening of said mixing chamber into said mold;

closing the controllable valves that control the chemicals to thereby reduce the pressure of the chemcials at said automatic valves to below said fixed pressure so as to automatically close said automatic valves, and withdrawing the mixing head from the mold; expanding and curing the foamable mixture in the mold; and

directly washing the surfaces of said automatic valves that are exposed to said mixing chamber with a solvent stream passing across said automatic valves, through said mixing chamber, across said mechanical mixer, and through said

discharge opening of said mixing chamber, in order, to thereby remove all mixed chemicals from the mixing head after the completion of the depositing of mixing chemicals.

4,138,455

METHOD FOR PREPARING DENSE, BETA-ALUMINA CERAMIC BODIES BY LIQUID PHASE SINTERING

Mohammed N. Shaikh, Salt Lake City; Ivan B. Cutler, Centerville; Anil V. Virkar, and Ronald S. Gordon, both of Salt Lake City, all of Utah, assignors to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 658,206, Feb. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 600,236, Jul. 30, 1975, abandoned. This application Apr. 15, 1977, Ser. No. 787,821

Int. Cl.[2] C04B *35/10*

U.S. Cl. 264—56 **18 Claims**

1. A method for preparing a dense, lithia stablizied B″-alumina containing ceramic body exhibiting a resistivity to 300° C. of between about 5 and about 20 ohm-cm comprising:

(A) forming a green ceramic body from a composition comprising:

(i) a first component comprising a liquid forming composition containing sodium aluminate and lithium aluminate; and

(ii) a second component comprising (a) alpha-alumina powder having a particle size in the range of about 0.3 to about 5 micrometers or (b) the reaction products formed by calcining said alpha-alumina powder with sodium carbonate, said components being used in such amounts that, after sintering to final density, the stoichiometric composition of the B″-alumina so formed is from about 5 to about 15 weight percent of sodium oxide, about 0.1 to about 5 weight percent of lithium oxide and about 94.9 to about 80 weight percent of aluminum oxide; and

(B) sintering said green body at a temperature between about 1440° C. to less than 1550° C. and for a time necessary to achieve the desired final density.

4,138,456

ARMOR STRUCTURE AND METHOD OF PRODUCING CERAMIC ARMOR

Richard A. Alliegro, Holden, Mass., assignor to Norton Company, Worcester, Mass.

Filed Oct. 24, 1967, Ser. No. 677,737

Int. Cl.[2] C04B *35/64*

U.S. Cl. 264—65 **1 Claim**

1. A method of simultaneously upgrading a mixture of arc furnace TiB_2 crude and TiC crude, while forming a hot pressed shape therefrom comprising the steps of making a quantitative analysis of the arc furnace crude to determine the free carbon content thereof, blending TiO_2 and B_2O_3 in substantially stoichiometric amounts, and then hot pressing the blended mass to the desired shape at a temperature in the range of from about 2050° C. to about 2250° C., at a pressure of from about 1500 psi to about 3000 psi, to produce a hard, dense, ceramic shape of a mixture of substantially pure TiC and TiB_2.

4,138,457

METHOD OF MAKING A PLASTIC TUBE WITH PLURAL LUMENS

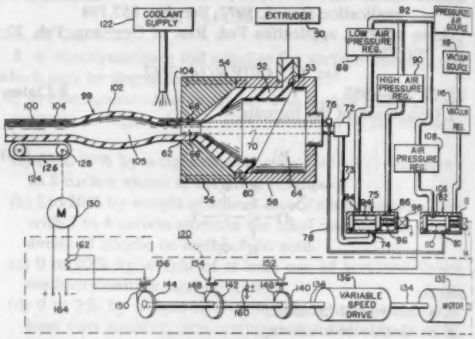
Ralph E. Rudd, Granville, and John I. Huggins, Argyle, both of N.Y., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Aug. 13, 1976, Ser. No. 714,230

Int. Cl.[2] B29C *17/02*; B29D *23/04*

U.S. Cl. 264—500 **18 Claims**

1. A method of making a plastic tube having a main body portion and an integral connector portion adapted for connection with a fluid coupling element comprising the steps of extruding molten plastic material through a die having a die orifice, a main lumen forming member for producing tubular extrudate with a main lumen issuing from the die orifice, and a hollow auxiliary lumen forming pin with an end adjacent the die orifice for producing a longitudinally extending auxiliary lumen in the sidewall of the extrudate, supplying gas to said forming pin to provide a predetermined gas pressure in the sidewall of the extrudate adjacent the die orifice for producing an auxiliary lumen in a predetermined portion of the extrudate



having a diameter less than the thickness of the sidewall to produce said main body portion, reducing the gas pressure in the sidewall of the extrudate adjacent the die orifice during the extrusion of a selected portion of the extrudate to limit the size of or eliminate the auxiliary lumen in said selected portion to produce said connector portion, and severing the extrudate to produce a tube having said main body and connector portions therein with the main lumen extending in both of said main body and connector portions.

4,138,458

COOLING THERMOPLASTIC TUBES

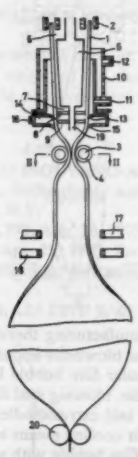
Derek Skilling, Dumfries, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 18, 1977, Ser. No. 816,664

Claims priority, application United Kingdom, Aug. 13, 1976, 33804/76

Int. Cl.[2] B29C *17/00*

U.S. Cl. 264—540 **9 Claims**



1. An apparatus for the production of a polymeric tubular film comprising

an annular orifice for extruding a polymeric material in the form of a tube;

an internal mandrel coaxial with, and of diameter less than

that of, the annular orifice for cooling and dimensioning the extruded tube;

cooling means for supplying cooling fluid to the external surface of the tube in the region of the mandrel;

withdrawing means downstream of said cooling means for withdrawing the cooled tube, said withdrawing means comprising a fluid-shedding movable surface means for drivingly engaging the external surface of the tube and for dispersing fluid from the interface between said withdrawing means and said tube external surface in a generally outward direction from a central region of said fluid-shedding surface means to an edge thereof; and

means downstream of the withdrawing means for stretching the withdrawn tube to form an oriented tubular film.

6. A method of producing a polymeric tubular film comprising the steps of

extruding a polymeric material in the form of a tube;

cooling the extruded tube by supplying a cooling fluid to the external surface of the tube;

withdrawing the cooled tube by engaging the external surface thereof with a moving fluid-shedding surface that disperses fluid from the interface between the fluid-shedding surface and the tube external surface in a generally outward direction from a central region of the fluid-shedding surface to an edge thereof; and

stretching the withdrawn tube to form an oriented tubular film.

4,138,459

PROCESS FOR PREPARING A MICROPOROUS POLYMER FILM

Irving Brazinsky, Matawan; William M. Cooper, Clinton, and Arnold S. Gould, New Providence, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 8, 1975, Ser. No. 611,300

Int. Cl.[2] B29C *17/02*; B29D *7/24, 27/00*

U.S. Cl. 264—154 **14 Claims**

1. In a process for the preparation of an improved open-celled microporous polymer film in which a non-porous, crystalline, elastic precursor polymer film, said precursor film having an elastic recovery at 0 recovery time when subjected to a standard strain of 50% at 25° C. and 65% relative humidity of at least 40% and a percent crystallinity of at least 20%, is uniaxially cold-stretched at a temperature in the range of between about −20° C. and a temperature 25° C. below the crystalline melting temperature of the polymer film followed by hot-stretching, in the same direction, said cold-stretched film at a temperature in the range of between about 25° C. below the crystalline melting temperature of the polymer film and 5° C. below the crystalline melting temperature of the polymer film to produce a microporous film, the improvement which comprises heat relaxing said hot-stretched film by exposing the film under tension to a temperature in the range of between about 40° C. below the crystalline melting temperature of the polymer film and 5° C. below the crystalline melting temperature of the film such that the maximum dimension, in the direction of stretch, of the hot-stretched microporous film is decreased by between about 15 and 20%, based on the length of said hot-stretched microporous film prior to relaxation.

4,138,460

METHOD FOR FORMING TUBESHEETS ON HOLLOW FIBER TOWS AND FORMING HOLLOW FIBER BUNDLE ASSEMBLIES CONTAINING SAME

Reuben A. Tigner, Bay City, Mich., assignor to Cordis Dow Corp., Miami, Fla.

Filed Jun. 10, 1977, Ser. No. 805,602

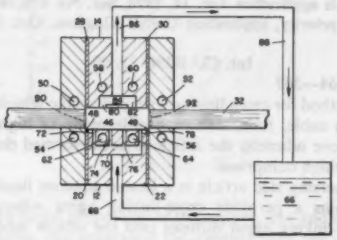
Int. Cl.[2] B29C *6/04*; B29F *1/10*

U.S. Cl. 264—159 **18 Claims**

1. A method for forming a tubesheet encapsulating a multiplicity of fibers in linearly arranged continuous tow form which comprises the steps of

(1) positioning a tow of fibers in a mold, said tow comprising a multiplicity of linearly arranged fibers,

(2) flowing a polymeric composition into said mold and through the interstices between said fibers in a direction substantially at a right angle to the longitudinal axis of said linearly arranged fibers and in a quantity and for a time sufficient to fill the interstices between said fibers and to fill said mold,



(3) causing said polymeric composition to solidify adjacent to the axial ends of said mold while said polymeric composition continues to flow across said fibers and to solidify and encapsulate said fibers therein to thereby form a tubesheet having the external configuration of the cavity of said mold, and

(4) removing said tubesheet from said mold.

4,138,461

DRY SPINNING COARSE-DENIER ACRYLIC FIBRES

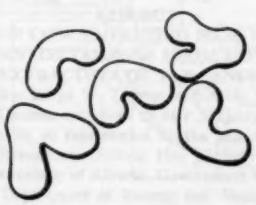
Ulrich Reinehr, and Wolfhard Schmidt, both of Dormagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,614

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658179

Int. Cl.[2] D01F *6/18*

U.S. Cl. 264—206 **4 Claims**



1. A process for the production of acrylic filaments or fibres having deniers of from 20 to 80 dtex and strengths of at least 1.5 cN/dtex, which comprises subjecting a spinning solution having a temperature of at last 90° C. and a viscosity of at least 100 ball drop seconds at 90° C. to dry spinning through spinnerets having a bore diameter of from 0.4 to 0.8 mm, the spinning duct temperature being at least 200° C. and the spinning gas temperature at least 350° C., the ratio of extrusion rate S in m/min. to the spinning bore diameter in mm amounting to at most 100, and the ratio of the draft to the spinning bore diameter in mm amounting to at most 50.

4,138,462

METHOD OF MANUFACTURING CROSS-LINKED MOULDED OBJECTS FROM CROSS-LINKABLE POLYMERIC MATERIALS

Francesco P. Procida, Lyngby; Svend S. Pedersen, Holbaek, and Peter Carstensen, Copenhagen, all of Denmark, assignors to Aktieselskabet Nordiske Kabel- og Traadfabriker, Copenhagen, Denmark

Continuation of Ser. No. 514,537, Oct. 15, 1974, abandoned. This application Apr. 14, 1976, Ser. No. 676,768

Claims priority, application United Kingdom, Oct. 15, 1973, 47993/73

Int. Cl.[2] B29C *25/00*

U.S. Cl. 264—347 **4 Claims**

1. A method for cross-linking a shaped article which is in the form of a cable, tube, slab or profile made of high density polyethylene whereby the article is not deformed during the process which comprises

(a) immersing said article in a heated aqueous liquid which contains a peroxide cross-linking agent whereby said cross-linking agent diffuses into the article wherein the time of immersion is sufficient to allow the desired depth of a penetration and the temperature is high enough to effect the desired rate of diffusion and low enough so that cross-linking can be kept low or eliminated.

(b) subsequently heating said article at a temperature at which the cross-linking will occur in an aqueous liquid whose density at that temperature is approximately the same as that of the article.

4,138,463

METHOD FOR FORMING SOLID FRICTION MATERIAL STRUCTURES

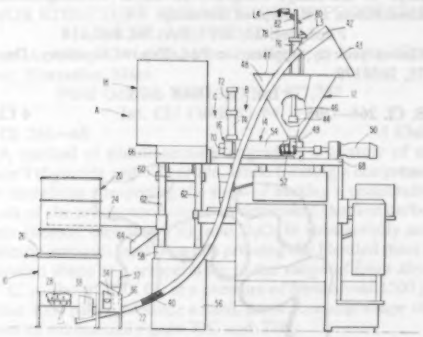
Edward E. Moneghan, Hatboro, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 633,054, Nov. 18, 1975, Pat. No. 4,108,935. This application May 23, 1977, Ser. No. 799,874

The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.

Int. Cl.[2] B29C *3/04*

U.S. Cl. 264—40.4 **18 Claims**



1. A method of producing molded bodies of friction material, such as brake pads and brake blocks, comprising:

(a) mixing predetermined quantities of dry friction material including asbestos fibers, thermosetting resin powder and friction modifying particles to obtain a supply of light and fluffy, dry homogeneously mixed ingredients;

(b) conveying said mixed ingredients from said supply through a closed dust-tight path comprising seriatim an enclosed mechanical conveyor, a closed stuffer hopper and an enclosed plasticizing screw, to an extrusion orifice defining termination of said path;

(c) metering arrival of said mixed ingredients at said extrusion orifice by controlling relative feed rates of said mechanical conveyor, stuffing means in said stuffer hopper and said plasticizing screw,

(d) heating said mixed ingredients within said plasticizing screw enclosure to plasticize the resin powder thereby forming plastizied ingredients at said extrusion orifice;

(e) extruding a portion of said plasticized ingredients through said orifice into a preform cup thereby forming an incremental charge;

(f) disengaging said incremental charge in said cup from plasticized ingredients remaining at said orifice;

(g) molding said incremental charge into a molded shape under heat and pressure to form a precured molded body; and

(h) heating said precured molded body until cured.

11. In a method of producing molded bodies of friction material including the steps of:

(a) charging a chamber through an aperture with a supply of light and fluffy dry homogeneously mixed friction material ingredients including predetermined quantities of asbestos fibers, thermosetting resin powder and friction modifying particles;

(b) closing said aperture;

(c) withdrawing mixed ingredients from said chamber through a withdrawal duct;

(d) conveying withdrawn mixed ingredients through a closed dust-tight transport path connecting said withdrawal duct to an extrusion orifice;

(e) heating and working said mixed ingredients within a portion of said transport path proximate said extrusion orifice to plasticize the resin powder thereby forming a plasticized mass of ingredients at said extrusion orifice;

(f) extruding a portion of said plasticized mass through said orifice into an open cup to form an incremental charge of plasticized friction material;

(g) disengaging said incremental charge in said cup from plasticized mass remaining at said orifice;

(h) transporting said incremental charge from said cup to a cavity of a molding press;

(i) molding said incremental charge into a molded shape under heat and pressure to form a precured molded body; and

(j) heating said precured molded body until cured;

that improvement comprising conveying said mixed ingredients, after withdrawal from said chamber through said duct, through a closed unheated mechanical conveyor forming an initial portion of said closed dust-tight path immediately downstream of said duct and leading into a closed stuffer hopper forming an intermediate portion of said closed dust-tight path at a rate to starve-feed said closed stuffer hopper by controlling feed rate of said closed mechanical conveyor, and then into proximity with an enclosed plasticized screw forming a final portion of said closed path by forcing said mixed ingredients through a discharge orifice of said stuffer hopper into said plasticizing screw enclosure with reciprocable stuffing means in said stuffer hopper.

4,138,464

BLOOD OXYGENATOR WITH INTEGRAL HEAT EXCHANGER

John E. Lewin, 13462 Eton Pl., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 685,020, May 10, 1976, Pat. No. 4,065,264. This application Dec. 23, 1977, Ser. No. 863,988

The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.

Int. Cl.[2] A61M *1/03*

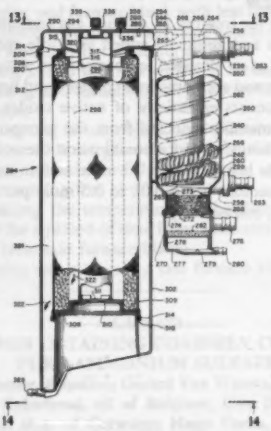
U.S. Cl. 422—46 **9 Claims**

1. A blood oxygenator having an integral heat exchanger for regulating the temperature of the blood flowing in an extracorporeal blood circuit, comprising:

an oxygenating chamber;

first means for introducing blood and bubbles of oxygen into said oxygenating chamber for forming blood foam within said chamber; and

second means for both (a) contributing to the transfer of oxygen into the blood and the removal of carbon dioxide from the blood, and (b) simultaneously regulating the temperature of said blood, said second means comprising: a heat transfer fluid conduit substantially entirely composed of highly thermal conductive, blood compatible material, and including heat exchange fluid inlet and outlet means, and having rib means disposed along its length for providing a blood flow passage considerably longer than the length of said fluid conduit, said rib means being located in contact with or closely proxi-



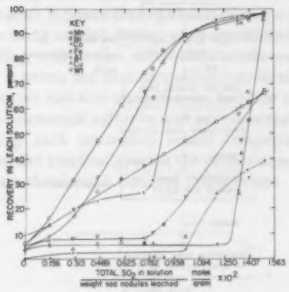
mate to the inner wall of said oxygenating chamber so that substantially all of said blood and blood foam produced by said first means flows in contact with the external surfaces of said heat transfer fluid conduit through a plurality of restricted area, extended length flow paths around the exterior of the heat transfer fluid conduit provided by said blood flow passage in combination with said inner wall prior to any substantial defoaming of the blood foam and with minimal areas of stagnation for said blood and blood foam with a resulting long residence time of blood and blood foam in contact with said heat transfer fluid conduit.

4,138,465
SELECTIVE RECOVERY OF NICKEL, COBALT, MANGANESE FROM SEA NODULES WITH SULFUROUS ACID

John E. Pahlman, Bloomington, and Sanna E. Khalafalla, Minneapolis, both of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 13, 1977, Ser. No. 860,249
Int. Cl.² C01G *45/00, 51/00, 53/00*
U.S. Cl. 423—49 **3 Claims**

1. A process for recovery of metal values from sea nodules comprising nickel, cobalt, manganese, copper, iron and aluminum, said process consisting essentially of reducing the nodules to a particle size of less than about 100 mesh, leaching them with dilute sulfurous acid, the ratio of moles of SO_2 in the leach solution to the total weight of the nodules, in grams, being in the range of about 0.94×10^{-2} to 1.25×10^{-2}, whereby nickel, cobalt and manganese are selectively extracted while



leaving the major proportion of the copper, iron and aluminum in the residue, and separating the solution from the residue.

4,138,466
PRODUCING CHROMATE SUBSTANTIALLY FREE OF VANADIUM

Johann N. Meussdoerffer; Wolfgang Bockelmann, both of Leverkusen, and Hans Niederprüm, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 841,234
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2650012
Int. Cl.² C01G *37/14, 31/00, 23/00*
U.S. Cl. 423—61 **8 Claims**

1. In the recovery of chromium from a residue containing calcium, chromate and vanadate, by oxidative decomposition of said residue in the presence of an alkali compound at temperatures of about 600° to 1200° C., and leaching such residue with water, the improvement which comprises adding titanium dioxide to the residue before or during decomposition and heating, the titanium dioxide being added in almost stoichiometric quantity to form calcium titanate based on the total calcium content less the quantity of calcium required to form calcium vanadate, whereby upon leaching the chromium enters the water while the calcium, vanadium and titanium are substantially left in the residue.

4,138,467
METHOD FOR CONCENTRATING HEAVY MINERALS IN THE SOLIDS TAILINGS FROM HOT WATER EXTRACTION OF TAR SANDS

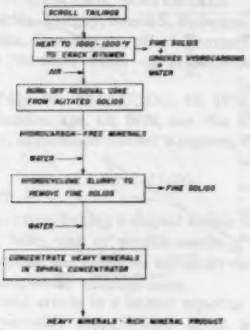
Victor Kaminsky; Lloyd W. Trevoy, and Alvin Maskwa, all of Edmonton, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; Ontario Energy Corporation; Imperial Oil Limited, both of Toronto; Canada-Cities Service, Ltd., Calgary and Gulf Oil Canada Limited, Toronto, all of Canada

Filed Mar. 4, 1977, Ser. No. 774,382
Int. Cl.² C01G *23/00, 25/00*
U.S. Cl. 423—74 **8 Claims**

1. A process for beneficiating hot water process froth treatment solids tailings containing bitumen, fine solids and titanium and zirconium minerals, which comprises:

introducing the solids tailings into a hot reaction zone and contacting the tailings particles with oxygen, while agitating them;

burning the bitumen and coke produced therefrom to produce clean particles; and


SCROLL TAILINGS
HEAT TO 1000 - 1200°F TO CRACK BITUMEN
FINE SOLIDS & CRACKED HYDROCARBONS & WATER
AIR
BURN OFF RESIDUAL COKE FROM ALTERED SOLIDS
HYDROCARBON - FREE MINERALS
WATER
HYDROCYCLONE SLURRY TO REMOVE FINE SOLIDS
FINE SOLIDS
WATER
CONCENTRATE HEAVY MINERALS IN SPIRAL CONCENTRATOR
HEAVY MINERALS - RICH MINERAL PRODUCT

passing the particles through wet gravity mineral concentrating means to concentrate and recover titanium and zirconium minerals.

4,138,468

METHOD AND APPARATUS FOR PRODUCING OR RECOVERING ALKANOLAMINE FROM A MIXTURE CONTAINING OXAZOLIDONE

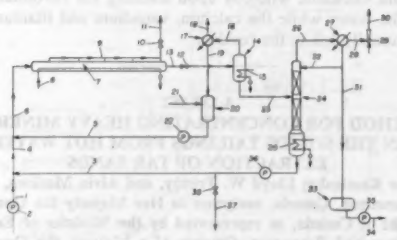
Roland Kettner, Heist, and Herbert Unland, Nienhagen, both of Fed. Rep. of Germany, assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 25, 1977, Ser. No. 781,237

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1976, 2645251

Int. Cl.² B01D *53/34*; C07C *91/04*

U.S. Cl. 423—228 **17 Claims**



11. In a method of separating acidic gases from a gaseous mixture by contacting the gaseous mixture with an absorption solution containing an alkanolamine, and wherein the absorption solution is regenerated and recovered and a residue remains containing a stable reaction product formed from at least a portion of said alkanolamine, the improvement comprising:

(a) mixing said residue containing a stable reaction product with at least an equal amount by weight of water;

(b) heating said mixture of water and residue containing a stable reaction product to a temperature of at least 120° C. for a time of at least 2 days to hydrolyze said stable reaction product and form said alkanolamine; and

(c) recovering said alkanolamine for reuse in said absorption solution.

4,138,469

PROCESS FOR CATALYTICALLY TREATING EXHAUST GAS CONTAINING NO_x IN THE PRESENCE OF AMMONIA GAS

Akira Kato; Shimpei Matsuda; Shigeo Uno; Jinichi Imahashi, all of Hitachi; Yoshihisa Watanabe; Makoto Imanari, both of Inasbiki, and Fumito Nakajima, Hitachi, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd.; Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, all of, Japan

Filed Mar. 28, 1977, Ser. No. 781,980

Claims priority, application Japan, Mar. 26, 1976, 51-32590

Int. Cl.² B01D *53/00*

U.S. Cl. 423—239 **26 Claims**

1. A process for treating an exhaust gas containing nitrogen oxides, oxygen and ammonia added as a sole reducing agent with a catalyst at an elevated temperature so as to convert the nitrogen oxides and ammonia into nitrogen and water, wherein the catalyst consists essentially of active oxides of titanium, copper and a member selected from the group consisting of molybdenum, tungsten and a combination thereof, an amount of copper oxide being 0.02 to 0.3 mole and an amount of the oxide of the member being 0.01 to 0.5 mole per one mole of titanium oxide, respectively.

4,138,470

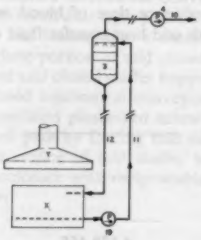
METHOD OF PREVENTING ESCAPE OF NITROGEN OXIDES FROM AN AQUEOUS NITRATE SOLUTION

Donald W. Bolme, c/o Donald W. Bolme & Associates, 10655 N.E. 4th St., Bellevue, Wash. 98004

Division of Ser. No. 548,104, Feb. 7, 1975, Pat. No. 4,053,555, and a continuation-in-part of Ser. No. 259,402, Jun. 5, 1972, abandoned. This application Aug. 22, 1977, Ser. No. 826,639

Int. Cl.² C01B *21/38, 21/40*

U.S. Cl. 423—390 **17 Claims**



1. A method for preventing the escape of nitrogen oxide from an acid bath and for preventing the boilover of such bath, said method comprising the steps of so controlling the nitric acid and total nitrate concentrations of said bath as to maintain the oxidizing potential of the bath at a level which is effective to convert the nitrogen oxides to the trivalent state by promoting the reaction:

$$2NO + NO_3^- + H_2O \rightarrow 3NO_2^- + 2H^+;$$

dissolving the trivalent material in the water present in said bath; removing a portion of the solution from the body thereof; removing trivalent materials in the separation portion of the aqueous solution therefrom; and returning that portion of the solution from which the trivalent materials were removed to said body of solution.

4,138,471
PROCESS FOR REDUCING THE POLYCYCLIC AROMATIC HYDROCARBON CONTENT OF CARBON BLACK

Trevor G. Lamond, and John L. Wells, both of Borger, Tex., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 691,740, Jun. 1, 1976, abandoned. This application Mar. 3, 1977, Ser. No. 774,091
Int. Cl.[2] C09C *1/56;* C01B *31/00, 31/02*
U.S. Cl. 423—460 3 Claims

1. A method of purifying a furnace black to reduce the level of polycyclic aromatic hydrocarbons to less than 2 micrograms per kilogram of furnace black, comprising the steps of:
(a) pelletizing said furnace black with less than 5% of binder so that there is no significant obstruction of the interparticulate spaces of the resulting pellets;
(b) charging a fluid bed unit with said furnace black;
(c) preheating said furnace black to about 500° F for about 30 minutes;
(d) fluidizing said furnace black with a flow of fluid containing at least 10% oxygen selected from the group consisting of air, air mixed with other gases, and combustion gases containing free air;
(e) maintaining the temperature of the fluidized bed from 1150° F for a period of time from 5 minutes to 165 minutes to heat treat said furnace black;
(f) quenching and recovering said furnace black.

4,138,472
PROCESS FOR OBTAINING COARSELY CRYSTALLINE PURE AMMONIUM SULFATE

Gerald Neubauer, Kapellen; Gerard Van Wauwe, Edegem; Josef Beullens, Kalmthout, all of Belgium; Uwe Brand, Lampertheim, Fed. Rep. of Germany; Hugo Fuchs, Ludwigshafen, Fed. Rep. of Germany, and Klaus Kartte, Beindersheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 844,647
Int. Cl.[2] C01C *1/242*
U.S. Cl. 423—549 5 Claims

1. In a process for obtaining coarsely crystalline pure ammonium sulfate from reaction mixtures containing caprolactam which have been obtained by Beckmann rearrangement of cyclohexanone-oxime with sulfuric acid or oleum, by neutralizing the mixtures with ammonia at an elevated temperature, with the addition of recycled ammonium sulfate mother liquor, the concentration being so chosen that during the neutralization no solid ammonium sulfate precipitates, separating the crude caprolactam from the ammonium sulfate solution, crystallizing ammonium sulfate by evaporating the ammonium sulfate solution under reduced pressure, separating off the crystallized ammonium sulfate and recycling the mother liquor to the neutralization stage, the improvement comprising: carrying out the neutralization at from 80° to 115° C. under autogenous pressure and evaporating the ammonium sulfate solution obtained after separating off the crude caprolactam under a pressure of from 200 to 600 mm Hg whilst cooling to from 72° to 101° C.

4,138,473
PROCESS FOR RECOVERING SULFUR FROM SOUR GAS

Joseph F. Gieck, 12887 Cambridge Cir., Leawood, Kans. 66209

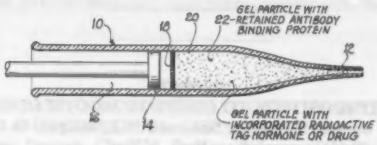
Filed Oct. 31, 1977, Ser. No. 847,240
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—574 R 4 Claims

1. A process for recovering elemental sulfur from a sour gas containing hydrogen sulfide, consisting of the successive steps of:
a. combusting said sour gas in a suitable reaction boiler with oxygen to provide hydrogen sulfide and sulfur dioxide in a 2:1 ratio in the outlet stream of said boiler,
b. passing the outlet stream of said boiler successively through a series of catalytic converters in each of which a portion of said H_2S and SO_2 react to form elemental sulfur in vapor form and steam,
c. condensing and removing said elemental sulfur from said stream after it passes through each of said converters, said stream being cooled during each condensation step, and
d. reheating said stream after each condensation step but before it enters the next successive converter to elevate it to optimum reaction temperature, in order to improve the yield of elemental sulfur in said next successive converter, obtaining each successive reheat temperature by compressing the reaction gases at the proper compression ratio to obtain the desired reaction temperature.

4,138,474
METHOD AND DEVICE FOR IMMUNOASSAY

Stuart J. Updike, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed May 1, 1973, Ser. No. 356,092
Int. Cl.[2] G01N *33/16;* A61K *43/00*
U.S. Cl. 424—1 4 Claims



2. A device for immunological determinations of a fluid system comprising an enclosure, a hollow needle communicating with one end of the enclosure, a porous barrier spanning the enclosure in spaced relation with the needle end to define a volume therebetween, dry highly hydrophilic, insoluble gel particles, a binding protein and a competing radioactive tag material within said gel particles, in which said gel particles are characterized by pores of a size which will prevent said binding protein from diffusing from the gel while permitting diffusion of small molecules into the intra gel volume, said gel particles filling the said volume within the enclosure, and means in communication with the enclosure beyond the porous barrier for drawing fluid to be tested through the needle and into and through the said volume.

4,138,475
SUSTAINED RELEASE PHARMACEUTICAL COMPOSITION

James McAinsh, and Raymond C. Rowe, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sep. 14, 1977, Ser. No. 833,339
Claims priority, application United Kingdom, Jun. 1, 1977, 23114/77
Int. Cl.[2] A61K *9/52, 9/54, 9/58*
U.S. Cl. 424—19 9 Claims

1. A sustained release pharmaceutical composition consisting of a hard gelatine capsule containing film coated spheroids, the said spheroids comprising, prior to coating, 40 to 65% by weight of propranolol, or a pharmaceutically-acceptable acid-addition salt thereof, in admixture with non-water-swellable microcrystalline cellulose, and the said spheroids having a film coat comprising ethylcellulose or ethycellulose and hydroxypropyl methylcellulose.

4,138,476

PLAQUE DISPERSING ENZYMES AS ORAL THERAPEUTIC AGENTS BY MOLECULAR ALTERATION

Lloyd G. Simonson, Waukegan, and Burton L. Lamberts, Libertyville, both of Ill., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 3, 1977, Ser. No. 821,275
Int. Cl.[2] A61K 7/28
U.S. Cl. 424—50 **23 Claims**

1. A technique for degrading plaque on the surfaces of teeth in the mouth cavity comprising:

forming a modified plaque-dispersing enzyme by,

selecting a plaque-dispersing enzyme,

selecting a carrier agent having an affinity for tooth surfaces greater than said plaque-dispersing enzyme, and

bonding said plaque-dispersing enzyme and carrier by reacting the same with a complexing reagent to form a modified enzyme having an affinity for tooth surfaces greater than the selected enzyme; and

introducing said modified enzyme into the mouth cavity to contact said teeth.

4,138,477

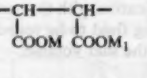
COMPOSITION TO CONTROL MOUTH ODOR

Maria Corazon S. Gaffar, Somerset, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Filed May 28, 1976, Ser. No. 691,262
Int. Cl.[2] A61K 7/16, 7/18, 9/68, 31/315
U.S. Cl. 424—52 **10 Claims**

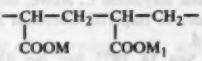
1. A non-astringent tasting oral composition to control mouth odor containing as the essential agent, a zinc-polymer complex having a pH of about 4.5 to 6, wherein said polymer is anionic, linear and contains ionizable carboxyl, sulfonic or phosphonic groups selected from the group consisting of

1. a copolymer of maleic anhydride with ethylene, or styrene, or isobutylene, or polymethyl vinyl ether, or polyethylvinyl ether, having recurring groups:



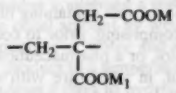
wherein M and M_1 are individually hydrogen, sodium, potassium or ammonium and may be the same or different, and X is ethylene, styrene, isobutylene, methylvinyl ether, and ethylvinyl ether,

2. a polyacrylic acid and polyacrylates thereof having recurring groups:



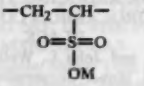
wherein M and M_1 have the same meaning as above,

3. a polyitaconic acid and polyitaconates thereof having recurring groups:



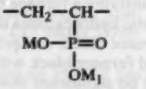
wherein M and M_1 have the same meaning as above,

4. a polyolefin sulfonate having recurring groups:



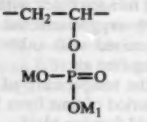
wherein M has the same meaning as above,

5. a polyvinyl phosphonate having recurring groups:



wherein M and M_1 have the same meaning as above,

6. and a polyvinyl phosphate having recurring groups:



wherein M and M_1 have the same meaning as above, and is ionically bound to a physiologically acceptable zinc salt selected from the group consisting of

zinc acetate	zinc isovalerate
zinc acetylacetonate	zinc D-lactate
zinc ammonium sulfate	zinc DL-lactate
zinc benzoate	zinc laurate
zinc bromide	zinc hexafluorosilicate
zinc beryllium orthosilicate	zinc methacrylate
zinc borate	zinc molybdate
zinc butylphthalate	zinc naphthenate
zinc butylxanthate	zinc octoate
zinc caprylate	zinc oleate
zinc carbonate	zinc orthophosphate
zinc chloroanilate	zinc phenolsulfonate
zinc chlorate	zinc pyridine-2-thiol-1-oxide
zinc chromate	zinc pyrophosphate
zinc citrate	zinc resinate
zinc cyclohexanebutyrate	zinc salicylate
zinc chloride	zinc sulfate
zinc gallate	zinc nitrate
zinc fluoride	zinc selenide
zinc alpha-glucoheptonate	zinc stearate
zinc gluconate	zinc sulfanilate
zinc glycerophosphate	zinc tartrate
zinc hydroxide	zinc tellurate
zinc 8-hydroxyquinoline	zinc tungstate
zinc 12-hydroxystearate	zinc valerate
zinc iodide	zinc vanadate
zinc acrylate	zinc tribromosalicylanilide
zinc oxide	zinc ricinoleate
zinc propionate,	

the ratio of zinc salt to anionic polymer being within the range of about 2:1 to 1:4.

4,138,478

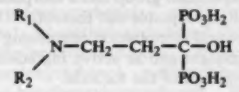
AGENTS FOR REDUCING THE DAMAGE TO HAIR DURING BLEACHING AND DYEING

Günter Reese, Dusseldorf; Erwin Weinrich, Haan, and Edgar Lieske, Düsseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 3, 1976, Ser. No. 738,475
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1975, 2549294
Int. Cl.[2] A61K 7/06, 7/13, 7/135
U.S. Cl. 424—62 **14 Claims**

1. An aqueous composition adapted to change the color of hair by the action of nascent oxygen therein, said composition having water, an oxidizing agent and an effective content of a

diphosphonic compound selected from the group consisting of aminopropane diphosphonic acids of the formula



wherein R_1 and R_2 each represent H or C_{1-3} alkyl, and the water-soluble salts thereof as an agent inhibiting the effect of said oxygen in degrading said hair.

4,138,479

PROCESS FOR THE PREPARATION OF IMMUNOPOTENTIATING AGENTS FROM COMPONENTS OF YEAST CELL WALL MATERIAL

Ernst Truscheit, Doenberg; Robert Bierling; Horst D. Schlumberger, both of Wuppertal, all of Fed. Rep. of Germany, and Herbert F. Oettgen, New York, N.Y., assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 629,927, Nov. 7, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,300

Int. Cl.[2] A61K *39/00, 39/02, 31/70*

U.S. Cl. 424—88 **11 Claims**

1. The process for the preparation of a water soluble immunopotentiating agent from components of yeast cell walls which comprises subjecting yeast cell wall material, proteolyzed yeast cell wall material or a carbohydrate-protein yeast cell wall material to extraction with water and phenol and thereafter isolating the water soluble agent.

11. The water soluble immunopotentiating agent produced according to the process of claim **10**.

4,138,480

NOVEL ANTHRACYCLINE GLYCOSIDES AND METHODS OF PREPARING THE SAME

Mario G. Gosalvez, C/Caleruega 21,7°A, Pinar de Chamartin Madrid 33, Spain

Filed Jan. 11, 1977, Ser. No. 758,446

Claims priority, application Spain, Jan. 16, 1976, 444,380

Int. Cl.[2] A61K *31/71;* **C07H** *15/24*

U.S. Cl. 424—180 **10 Claims**

10. A method of treating transplanted tumors in mice comprising administering to a tumor-bearing mouse an antitumorally effective amount of a compound selected from the group consisting of triferric doxorubicin and triferric daunorubicin.

4,138,481

ANTIBIOTIC BL580Δ AND METHOD OF USE

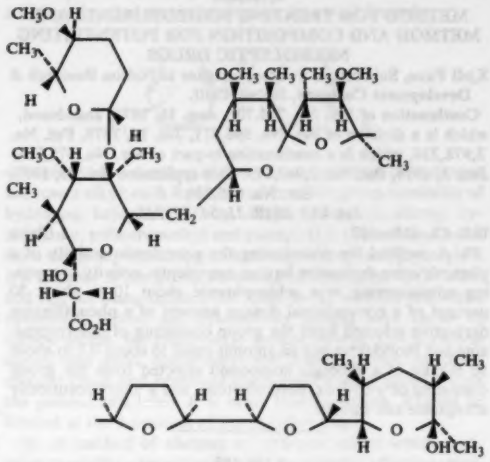
John H. E. J. Martin, New City, and Martin R. Hertz, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 701,395, Jun. 30, 1976, abandoned. This application Jan. 4, 1977, Ser. No. 756,659

Int. Cl.[2] A61K *31/71;* **C07H** *7/06*

U.S. Cl. 424—181 **5 Claims**

2. A method of treating coccidiosis in poultry which comprises administering orally to said poultry an anticoccidially-effective amount of a compound selected from the group consisting of the antibiotic of the formula:



and the pharmacologically acceptable cationic salts thereof.

4,138,482

3-CYANO-N-(N,N-DIMETHYLAMINOPROPYL)-IMINODIBENZYL AND SALTS THEREOF

Philippe Dostert, Chaville, France, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 11, 1977, Ser. No. 840,790

Claims priority, application Switzerland, Oct. 12, 1976, 12876/76

Int. Cl.[2] A61K *31/55;* **C07D** *223/28*

U.S. Cl. 424—244 **3 Claims**

1. 3-Cyano-N-(N,N-dimethylaminopropyl)-iminodibenzyl or a pharmaceutically acceptable acid addition salt thereof.

3. A pharmaceutical composition for the treatment of depression consisting essentially of an effective amount of 3-cyano-N-(N,N-dimethylaminopropyl)iminodibenzyl or a pharmaceutically acceptable acid addition salt thereof for the treatment of depression in warm-blooded mammals and a pharmaceutically acceptable carrier material.

4,138,483

INSECTICIDAL COMPOSITIONS CONTAINING CERTAIN TETRAORGANOTIN COMPOUNDS AND METHOD FOR USING SAME

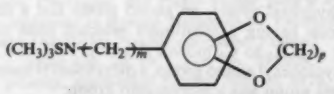
Melvin H. Gitlitz, Edison; John E. Engelhart, Westfield, both of N.J., and Carlos M. Mery, Bogota, Colombia, assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Nov. 11, 1977, Ser. No. 850,856

Int. Cl.[2] A01N *9/00, 9/28*

U.S. Cl. 424—245 **4 Claims**

1. A composition for killing insects on useful plants, the composition consisting essentially of an inert diluent and an insecticidally effective amount of a tetraorganotin compound of the formula



herein said —O—$CH_2)_p$O— group is bonded to adjacent carbon atoms of the phenyl ring, m is 0 or 1 and p is 1 or 2.

4,138,484
METHOD FOR TREATING SCHIZOPHRENIA AND METHOD AND COMPOSITION FOR POTENTIATING NEUROLEPTIC DRUGS

Kjell Fuxe, Sollentuna, Sweden, assignor to Nelson Research & Development Company, Irvine, Calif.

Continuation of Ser. No. 714,707, Aug. 16, 1976, abandoned, which is a division of Ser. No. 596,571, Jul. 16, 1975, Pat. No. 3,978,216, which is a continuation-in-part of Ser. No. 475,856, Jun. 3, 1974, Pat. No. 3,947,579. This application Jul. 25, 1977, Ser. No. 818,534

Int. Cl.[2] A61K *31/54, 31/335*

U.S. Cl. 424—247 **1 Claim**

1. A method for potentiating the neuroleptic activity of a phenothiazine derivative having neuroleptic activity comprising administering to a schizophrenic about 10 to about 50 percent of a conventional dosage amount of a phenothiazine derivative selected from the group consisting of chlorpromazine and thoridazine and an amount equal to about 0.1 to about 50 mg/kg of a gabergic compound selected from the group consisting of γ-hydroxybutyrolactone, and a pharmaceutically acceptable salt thereof.

4,138,485
PHENYLALANINE DERIVATIVES

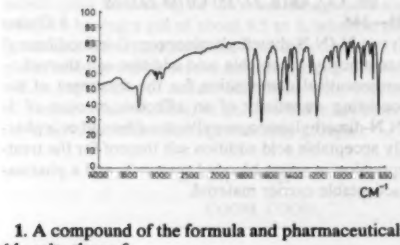
Nobuhiro Nakamizo; Masayuki Teranishi; Ikuo Matsukuma, all of Machida; Katsuichi Shuto, and Koji Yamada, both of Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Ohte, Japan

Filed Feb. 24, 1977, Ser. No. 771,726

Claims priority, application Japan, Feb. 25, 1976, 51-18871; Feb. 25, 1976, 51-18872; Jun. 18, 1976, 51-70958; Nov. 24, 1976, 51-140949

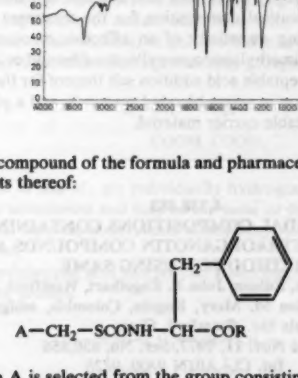
Int. Cl.[2] A61K *31/535;* **C07C** *153/11;* **C07D** *211/06;* **A61K** *31/27*

U.S. Cl. 424—248.5 **15 Claims**



1. A compound of the formula and pharmaceutically acceptable salts thereof:

[I]

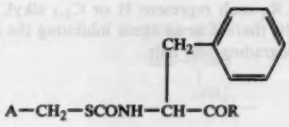


wherein A is selected from the group consisting of a naphthyl group, a substituted phenyl group having 1 to 5 substituents selected from the group consisting of a C_1 to C_5 alkyl and C_1 to C_4 alkoxy group: a substituted phenyl group having 1 to 3 substituents selected from the group consisting of an acetoxy group, a halogen atom, hydroxyl group and a nitro group, when R is selected from the group consisting of an alkoxy group, a hydroxyl group, an amino group and a substituted amino group having a substituent selected from the group consisting of a C_1 to C_5 monalkyl group, a C_1 to C_5 dialkyl group, a cyclohexyl amino group, a dicyclohexyl amino group, a piperidino group and a morpholino group;

and A is a phenyl group when R is selected from the group consisting of a methoxy group, an amino group and a substituted amino group having a substituent selected from the group consisting of a C_1 to C_5 monoalkyl group, a C_1 to C_5 dialkyl group, a cyclohexyl amino group, a dicyclohexyl amino group, a piperidino group and a morpholino group; and a pharmaceutically acceptable salt thereof.

8. A pharmaceutical composition comprising a pharmaceutical carrier or excipient and as active ingredient, an effective amount of a compound of the formula:

[I]



wherein A is selected from the group consisting of a phenyl group; a substituted phenyl group having 1 to 5 substituents selected from the group consisting of a C_1 to C_5 alkyl and an acetoxy; a substituted phenyl group having 1 to 3 substituents selected from hydroxy group, a nitro group and a naphthyl group; and R is selected from the group consisting of a hydroxy group, an alkoxy group, an amino group, and a substituted amino group having a substituent selected from the group consisting of a C_1 to C_5 monalkyo group, a C_1 to C_5 dialkyl group, a cyclohexylamino group, a dicyclohexylamino group, a piperidino group and a morpholino group; and a pharmaceutically acceptable salt thereof.

4,138,486
ARYLMALONAMIDO-1-OXADETHIACEPHALOSPORINS

Masayuki Narisada, Ibaraki, and Wataru Nagata, Nishinomiya, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

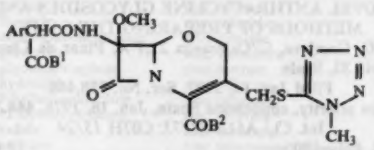
Filed Mar. 22, 1977, Ser. No. 780,183

Claims priority, application Japan, Mar. 25, 1976, 51-33401; Apr. 30, 1976, 51-50295

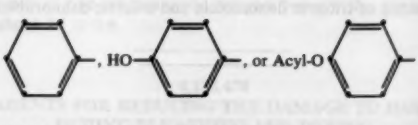
Int. Cl.[2] A61K *27/00, 31/695, 31/555*

U.S. Cl. 424—248.52 **41 Claims**

1. A compound selected from the group consisting of (a) a compound of the formula



wherein
Ar is



in which Acyl is alkanoyl containing 1 to 5 carbon atoms, carbamoyl, N-alkylcarbamoyl containing 2 to 6 carbon atoms, or ureidocarbonyl;

COB^1 and COB^2 each is carboxy, methoxycarbonyl, ethoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, t-butoxycarbonyl, pentyloxycarbonyl, cyclopropylmethoxycarbonyl, monohydroxy-t-butoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, chloromethoxycarbonyl, cyanomethoxycarbonyl, methanesulfonylethoxycarbonyl, acetylmethoxycarbonyl, acetoxymethoxycarbonyl, acetoxyethoxycarbonyl, propionyloxymethoxycarbonyl, propionyloxyethoxycarbonyl, pivaloyloxymethoxycarbonyl, benzoyloxymethoxycarbonyl, methoxymethoxycarbonyl, phenoxymethoxycarbonyl,

methylthiomethoxycarbonyl, phenylthiomethoxycarbonyl, α,α-dimethylproparglyoxycarbonyl, methoxycarbonyloxyethoxycarbonyl, ethoxycarbonylethoxycarbonyl, methoxycarbonyloxypropoxycarbonyl, allyloxycarbonyl, benzyloxycarbonyl, phenethyloxycarbonyl, tolylmethoxycarbonyl, dimethylbenzyloxycarbonyl, nitrobenzyloxycarbonyl, halobenzyloxycarbonyl, methoxybenzyloxycarbonyl, p-hydroxy-di-t-butylbenzyloxycarbonyl, diphenylmethoxycarbonyl, trityloxycarbonyl, phenacyloxycarbonyl, chlorophenacyloxycarbonyl, bromophenacyloxycarbonyl, nitrophenacyloxycarbonyl, methylphenacyloxycarbonyl, trimethylsilyloxycarbonyl, dimethylmethoxysilyloxycarbonyl, trimethylstannyloxycarbonyl, phenoxycarbonyl, naphthyloxycarbonyl, tolyloxycarbonyl, dimethylphenoxycarbonyl, nitrophenoxycarbonyl, methoxyphenoxycarbonyl, methanesulfonylphenoxycarbonyl, chlorophenoxycarbonyl, pentachlorophenoxycarbonyl, indanyloxycarbonyl, sodiooxycarbonyl, potassiooxycarbonyl, magnesiooxycarbonyl, calciooxycarbonyl, or a salt of carboxy group with procain, xylocain, triethylamine, or dicyclohexylamine;

and (b) when at least one of COB^1 and COB^2 is carboxy, a pharmaceutically acceptable salt thereof.

20. A bactericidal composition comprising a bactericidally effective amount of a compound according to claim **1** and a pharmaceutically acceptable carrier.

4,138,487

1,2-DITHIOLE DERIVATIVES

Michel Barreau; Claude Cotrel, both of Paris, and Claude Jeanmart, Brunoy, all of France, assignors to Rhone-Poulenc Industries, Paris, France

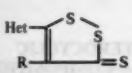
Division of Ser. No. 766,966, Feb. 9, 1977. This application Nov. 28, 1977, Ser. No. 855,385

Claims priority, application France, Feb. 10, 1976, 76 03604; Dec. 23, 1976, 76 38901

Int. Cl.² C07D *237/08, 237/18, 237/20*

U.S. Cl. 424—250 **8 Claims**

1. A 1,2-dithiole derivative of the formula:



wherein Het represents pyridazin-3-yl or pyridazin-4-yl, or pyridazin-3-yl or pyridazin-4-yl substituted by alkyl of 1 through 4 carbon atoms, mercapto, dialkylamino having 1 through 4 carbon atoms in each alkyl, or pyrrolidin-1-yl, and R represents alkyl of 1 through 4 carbon atoms.

8. A pharmaceutical composition which comprises a 1,2-dithiole derivative as claimed in claim **1** in association with one or more compatible and pharmaceutically acceptable diluents or adjuvants.

4,138,488

DIPHENYLMETHYL PICOLINIC ACID DERIVATIVES AND THEIR USE AS ANTI-ACNE AGENTS

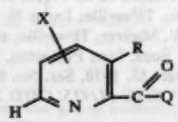
Margaret H. Sherlock, Bloomfield, and Heide Roebke, Belleville, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 636,009, Nov. 28, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,297

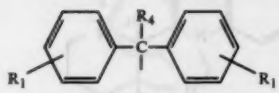
Int. Cl.² **A61K** *31/455;* **C07D** *213/56*

U.S. Cl. 424—250 **22 Claims**

1. A compound of the formula:

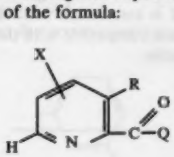


and the pharmaceutically acceptable salts thereof wherein X is a diphenylmethyl group having the structural formula:

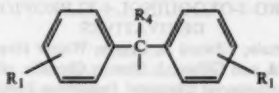


wherein R_4 is a member of the group consisting of hydrogen and lower alkyl; each R_1 is a member of the group consisting of hydrogen, halogen, hydroxy, alkyl, cycloalkyl, alkoxy, cycloalkoxy, trifluoromethyl and phenyl; Q is a member selected from the group consisting of hydroxy, alkoxy and glyceryl; R is a member of the group consisting of hydrogen, lower alkyl and X_1, X_1 being defined the same as X; wherein the alkyl, cycloalkyl, alkoxy and cycloalkoxy groups have up to 12 carbon atoms, the lower alkyl groups having 1 to 6 carbon atoms, said alkyl, lower alkyl and alkoxy groups including straight chain and branched chain hydrocarbyl groups; with the proviso that when R is other than hydrogen, X must be located at the 5-position of the pyridine ring.

22. A method of eliciting an anti-acne effect which comprises topically administering a therapeutically effective quantity of a compound of the formula:



and the pharmaceutically acceptable salts thereof wherein X is a diphenylmethyl group having the structural formula:



wherein R_4 is a member of the group consisting of hydrogen and lower alkyl; each R_1 is a member of the group consisting of hydrogen, halogen, hydroxy, alkyl, cycloalkyl, alkoxy, cycloalkoxy, trifluoromethyl and phenyl; Q is a member selected from the group consisting of hydroxy, alkoxy and glyceryl; R is a member of the group consisting of hydrogen, lower alkyl and X1, X1 being defined the same as X; wherein the alkyl, cycloalkyl, alkoxy and cycloalkoxy groups have up to 12 carbon atoms, the lower alkyl groups having 1 to 6 carbon atoms, said alkyl, lower alkyl and alkoxy groups including straight chain and branched chain hydrocarbyl groups; with the proviso that when R is other than hydrogen, X must be located at the 5-position of the pyridine ring.

4,138,489

VASODILATING OCTAHYDRO-1,12-METHANO-OXYMETHANO[2,3-A]-INDOLOQUINOLIZINES

Claude Thal, Sceaux; Richard Besselievre, Gif sur Yvette; Henri P. Husson, Chevreuse, and Pierre Potier, Bois d'Arcy, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

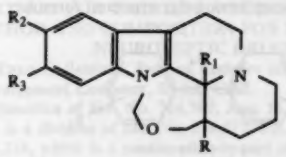
Filed Jun. 25, 1976, Ser. No. 700,028

Claims priority, application France, Jun. 25, 1975, 75 19960

Int. Cl.² **A61K** *31/445;* **C07D** *498/06*

U.S. Cl. 424—256 **4 Claims**

1. A pentacyclic derivative of the general formula:



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in which:

R represents a hydrogen atom or a hydroxymethyl radical,

R_1 represents a hydrogen atom,

R and R_1 being in the trans position in relation to one another, and R_2 and R_3, which may be the same or different, represent a hydrogen atom or a halogen atom or an alkyl radical containing 1 to 4 carbon atoms or alkyloxyl radical whose alkyl part contains 1 to 4 carbon atoms, or else R_2 and R_3 together form a dioxymethylene radical, its optically active forms, its pharmaceutically acceptable addition salts with acids, its pharmaceutically acceptable quaternary ammonium salts and its N-oxides.

4. A vasodilating composition for use in Human therapy, comprising an effective vasodilating amount of a product according to claim 1 in association with one or more diluents or adjuvants which are compatible with the product and pharmaceutically acceptable.

4,138,490

ANALGESIC COMPOSITIONS CONTAINING 1,2-DIHYDRO-2-OXOQUINOL-4-YLPROPIONIC ACID DERIVATIVES

David R. Brittain; Edward D. Brown; Walter Hepworth, all of Macclesfield, and Gilbert J. Stacey, Cheadle, all of England, assignors to Imperial Chemical Industries Limited, London, England

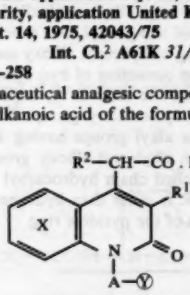
Continuation-in-part of Ser. No. 662,685, Mar. 1, 1976, Pat. No. 4,066,651. This application Sep. 12, 1977, Ser. No. 832,613

Claims priority, application United Kingdom, Mar. 20, 1975, 11644/75; Oct. 14, 1975, 42043/75

Int. Cl.[2] A61K *31/545*

U.S. Cl. 424—258 **7 Claims**

1. A pharmaceutical analgesic composition which comprises a quinolone alkanoic acid of the formula



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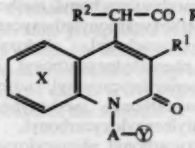
wherein A is a methylene, ethylene or propenylene; R^1 is hydrogen; R^2 is methyl; R^3 is hydroxy, amino, hydroxylamino, C_{1-6}-alkoxy or phenoxy; and wherein the benzene ring X is unsubstituted or bears either a single substituent selected from the group consisting of halogen, methyl, methoxy, nitro and amino, or two methyl substituents; and wherein ring Y is phenyl which may be monosubstituted by a nember selected from the group consisting of halogen, methyl, methoxy, methylthio and trifluoromethyl; or a pharmaceutically acceptable salt thereof; in pharmaceutically-acceptable form.

5. A method of producing an analgesic effect in a warm-blooded animal which comprises administering to the said animal an effective amount of a compound of the formula:



wherein A is methylene, ethylene or propenylene; R^1 is hydrogen; R^2 is methyl; R^3 is hydroxy, amino, hydroxylamino, C_{1-6} alkoxy or phenoxy; and wherein the benzene ring X is unsubstituted or is monosubstituted by a member selected from the group consisting of halogen, methyl, methoxy, nitro and amino, or is dimethyl substituted; and wherein ring Y is phenyl which may be monosubstituted by a member selected from the group consisting of halogen, methyl, methoxy, methylthio and trifluoromethyl; or a pharmaceutically acceptable salt thereof.

4,138,491

METHOD FOR TREATING DIABETES

Fumiyoshi Ishikawa; Akira Kosasayama; Yoshifumi Watanabe; Yasushi Abiko; Kin-ya Kameda, and Shin-etu Ono, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,814

Claims priority, application Japan, Jun. 24, 1976, 51-74668

Int. Cl.[2] A61K *31/44, 31/415*

U.S. Cl. 424—263 **1 Claim**

1. A method for treating diabetes comprising administering a therapeutically effective amount of 2-[2-phenyl-2-(2-pyridyl)-]ethylimidazoline to a patient having diabetes.

4,138,492

AROMATIC AMIDES OF HETEROCYCLIC COMPOUNDS AND THERAPEUTIC COMPOSITIONS CONTAINING SAME

Armando V. Noverola; Jose P. Soto, and R. G. W. Spickett, all of Barcelona, Spain, assignors to Anphar, S.A., Madrid, Spain

Filed Mar. 17, 1975, Ser. No. 558,908

Claims priority, application United Kingdom, Mar. 21, 1974, 12572/74

Int. Cl.[2] C07D *211/58;* A61K *31/445*

U.S. Cl. 424—267 **10 Claims**

1. N-[4'-(1'-benzyl)-piperidyl]-2-methoxy-4-amino-5-chlorobenzamide or pharmaceutically acceptable salts thereof.

4. A method for treating gastrointestinal tract disorders which comprises administering in an effective amount the compound of claim 1 to a host.

4,138,493

2,2-DIHALO-1(3)-LOWER ALKYL-CYCLOPROPYLALKYLTHIO BENZIMIDAZOLE DERIVATIVES, COMPOSITIONS THEREOF AND METHOD OF USE IN TREATING TAPEWORMS AND WHIPWORMS

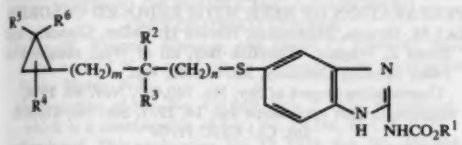
Rudiger D. Haugwitz, Titusville; Larry R. Cruthers, Flemington, and Barbara V. Maurer, Titusville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 13, 1978, Ser. No. 885,717

Int. Cl.[2] A61K *31/415;* C07D *235/32*

U.S. Cl. 424—273 B **15 Claims**

1. A compound of the structure



wherein R^1 is lower alkyl or phenyl-lower alkyl, R^2 and R^3 are the same or different and are hydrogen or lower alkyl, R^4 is lower alkyl or phenyl, and R^5 and R^6 are the same or different and are chlorine, bromine, fluorine or iodine, m is 0 to 3, n is 0 to 3, and m + n is ≦ 5, and physiologically acceptable salts thereof.

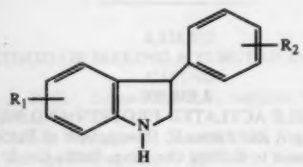
7. A parmaceutical composition for use in treating or preventing tapeworm or whipworm comprising a therapeutically effective amount of a compound as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

4,138,494
3-PHENYLINDOLINES

Radolf Kubela, Cote St. Luc; Vaclav Musil, and Lise A. Hughes, both of Ville-de-Lery, all of Canada, assignors to Delmar Chemicals Limited, LaSalle, Canada

Division of Ser. No. 589,402, Jun. 23, 1975, Pat. No. 4,080,330. This application Nov. 15, 1976, Ser. No. 741,665
Int. Cl.[2] A61K *31/40;* C07D *209/04*
U.S. Cl. 424—274 10 Claims

1. A 3-phenylindoline having the following general formula:



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wherein R_1 and R_2 individually represents hydrogen, halogen, lower alkoxy or lower alkyl, or a pharmaceutically acceptable addition salt thereof with an inorganic or organic acid.

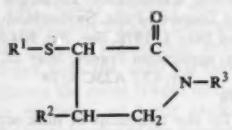
6. A pharmaceutical composition for controlling coagulation of the blood containing as active ingredient an anti-blood clot formation effective amount of a 3-pheny-lindoline of formula I as defined in claim 1 or a pharmaceutically acceptable addition salt thereof with an inorganic or organic acid.

4,138,495
N-SUBSTITUTED PYRROLIDONES AND THEIR USE AS MITICIDES

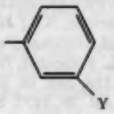
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 19, 1978, Ser. No. 907,514
Int. Cl.[2] A01N *9/12, 9/22;* C07D *207/26*
U.S. Cl. 424—274 21 Claims

1. A compound having the formula

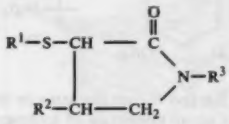


in which
R^1 is C_1-C_4 alkyl,
R^2 is selected from the group consisting of hydrogen and $-CH_2X$ in which X is halogen, and
R^3 is selected from the group consisting of allyl and

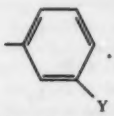


in which Y is selected from the group consisting of halogen and trifluoromethyl.

8. A miticidal composition comprising
a. a compound having the formula



in which
R^1 is C_1-C_4 alkyl,
R^2 is selected from the group consisting of hydrogen and $-CH_2X$ is halogen, and
R^3 is selected from the group consisting of allyl and



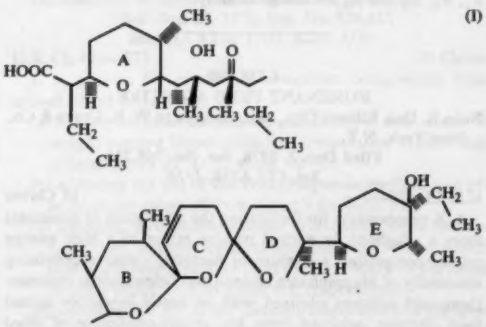
in which Y is selected from the group consisting of halogen and trifluoromethyl; and
b. an inert diluent carrier.

4,138,496
SY-1 SUBSTANCE

Akira Shibata, Zama; Yukio Miyazaki, Ageo; Kiyoshi Tsuda, Tokyo; Noboru Otake, Yokohama, and Haruyasu Kinashi, Tokyo, all of Japan, assignors to Kaken Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1977, Ser. No. 808,611
Int. Cl.[2] A61K *31/35;* C07D *309/06*
U.S. Cl. 424—283 4 Claims

1. SY-1 substance having the formula



(I)

and pharmaceutically acceptable esters or salts thereof.

4. A composition for improving feed utilization in animals containing as its principal active ingredient an effective amount of the SY-1 substance of claim 1 wherein said composition is a component of feed for ruminants, and said effective amount represents a dose of from 0.05 to 5.0 mg/kg/day per animal.

4,138,497

INDANPENTOL DERIVATIVES FOR TREATING HYPERTENSION

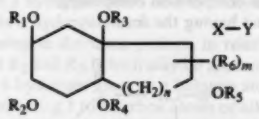
Frederic P. Hauck, Somerville, N.J.; Joseph E. Sundeen, Yardley, Pa., and Joyce Reid, Highland Park, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 649,116, Jan. 14, 1976, Pat. No. 4,053,596. This application Jul. 29, 1977, Ser. No. 820,290

Int. Cl.[2] A61K *31/13, 31/215;* **C07C** *67/00, 103/00*

U.S. Cl. 424—305 **15 Claims**

1. A compound of the structure



wherein R_1, R_2, R_3, and R_4 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, trifluoromethyl, mono-halo-lower alkyl wherein the halogen is F, Cl, Br or I, acyl radical of a hydrocarbon carboxylic acid of less than 12 carbon atoms, amido, lower alkoxyalkylene and lower alkoxy carbonyl, R_5 is hydrogen, lower alkyl, trifluoromethyl, mono-halo-lower alkyl, or lower alkoxy-alkylene, X is a single bond or a straight or branched chain alkylene group of the structure $(CH_2)_n$, wherein n' is 0 to 10, Y is

wherein R_7 and R_8 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, trifluoromethyl, monocyclic cycloalkyl having 3 to 6 ring members, monocyclic cycloalkyl lower alkyl, wherein the cycloalkyl has 3 to 6 ring members, hydroxy-lower alkyl, phenyl, lower alkylphenyl, acyl radical of a hydrocarbon carboxylic acid of less than 12 carbon atoms, di(lower alkyl)phenyl, halophenyl, mono-, di- or tri-nitrophenyl, phenyl lower alkyl, wherein lower alkyl contains 1 to 8 carbons, R_6 is lower alkyl or cycloalkyl having 3 to 6 ring members, and n is 1 to 3; m is 0, 1 and 2; stereoisomers thereof, physiologically acceptable acid salts thereof, physiologically acceptable quaternary salts thereof and N-oxides thereof.

12. A compound according to claim 1 wherein R_5 is H and R_1, R_2, R_3 and R_4 are lower alkanoyl.

4,138,498

RUMINANT FEED ADDITIVE

Naba K. Das, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Dec. 7, 1976, Ser. No. 748,210

Int. Cl.[2] A23K *1/18*

U.S. Cl. 426—2 **14 Claims**

1. A composition for facilitating the adaptation of ruminants from a roughage or normal pasture ration to a high energy ration, comprising a mixture of bacterial cultures consisting essentially of Megasphaera elsdenii and Selenomonas ruminantium, said cultures admixed with an orally ingestible animal feed additive, selected from the group consisting of dried grains, alfalfa, corn meal, citrus meal, fermentation residues, ground oyster shells, attapulgus clay, wheat shorts, molasses solubles, corn cob meal, edible vegetable substances, toasted dehulled soya flour, soybean mill feed, antibiotic mycelis, vermiculite, soya grits and crushed limestone, said composition reducing or eliminating the symptoms of lactic acidosis during adaptation of said ruminants to said high energy ration.

4,138,499

PREPARATION OF BEER WITH REDUCED CALORIES

Karl M. Strauss, Milwaukee; Harold H. Geller, Glendale, and Bernd J. Wagner, Whitefish Bay, all of Wis., assignors to Pabst Brewing Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 740,437, Nov. 10, 1976, abandoned. This application Jul. 14, 1977, Ser. No. 816,670

Int. Cl.[2] C12C *11/04*

U.S. Cl. 426—16 **9 Claims**

1. A process of preparing a low dextrin and low carbohydrate beer with reduced calories which consists essentially of fermenting an all-grain malt wort or a wort obtained from a mixture of grain malt and not more than about 30% by weight non-malt grain with brewer's yeast, continuing the fermentation for a period of time until a major proportion of the fermentable ingredients in said wort have been fermented, then adding to the resultant alcoholic wort a quantity of sugar solution containing one or more sugars readily fermentable by brewer's yeast in an amount so that the sugar solution has a Plato value substantially equal to the Plato value of said wort prior to fermentation, the volume ratio of wort derived from the malt grain or mixtures of malt grain and non-malt grain and the sugar solution being within the range of from 30% malt grain wort and 70% sugar solution to 60% malt grain wort and 40% sugar solution and completing the fermentation until a real degree of fermentation of at least 80% using common brewer's yeast is obtained thus resulting in a product which contains not more than about 96 calories per twelve fluid ounces and not more than about 3.2% alcohol by weight.

4,138,500

ACID SOLUBLE ACYLATED PROTEIN AND METHOD

Charles V. Fulger, and James E. Dewey, both of Battle Creek, Mich., assignors to Kellogg Company, Battle Creek, Mich.

Filed May 2, 1977, Ser. No. 792,973

Int. Cl.[2] A23L *1/20*

U.S. Cl. 426—46 **8 Claims**

1. Method for producing a modified proteinaceous food having mild flavor comprising the steps of first hydrolyzing protein obtained from oleaginous seeds with a proteolytic enzyme to form an acid soluble polypeptide mixture, and then acylating said mixture to form an acylated hydrolyzate.

4,138,501

DEMINERALIZATION OF WHEY

Michel Chavéron, Vevey; Jaak-Jüri Sihver, Villeneuve, and Hubert Duperrex, La Tour-de-Peilz, all of Switzerland, assignors to Societe d'Assistance Technique Pour Produits Nestle S.A., La Toure-de-Peilz, Switzerland

Filed May 1, 1978, Ser. No. 901,524

Claims priority, application France, May 23, 1977, 77 15732

Int. Cl.[2] A23C *9/14*

U.S. Cl. 426—239 **12 Claims**

1. A process for the treatment of milk serum in order to obtain a demineralised milk serum, which comprises subjecting the milk serum in a clarified and skimmed state, to electrodialysis, and then to ion exchange with the aid of a strong cation exchange resin in the H^+ cycle and a weak anion exchange resin in the OH^- cycle.

4,138,502
METHOD OF PRODUCING A DARKENED FREEZE-DRIED COFFEE

Charles W. Ehrgott, Rumson, and David C. Edwards, River Edge, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

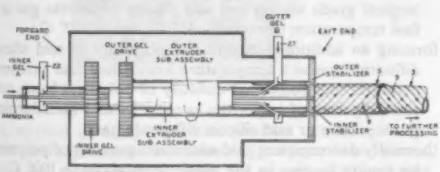
Continuation of Ser. No. 421,019, Dec. 3, 1973, abandoned, which is a continuation of Ser. No. 79,340, Oct. 8, 1970, abandoned. This application Jul. 17, 1974, Ser. No. 485,854
Int. Cl.[2] A23F *1/04*
U.S. Cl. 426—385 1 Claim

1. A method for obtaining darkened freeze-dried coffee comprising the steps of:
(a) rapidly freezing coffee extract
(b) grinding the frozen extract and
(c) drying the frozen ground extract in a vacuum chamber, the pressure in the vacuum chamber being maintained and controlled at from 400 to 500 microns of mercury for the initial one to five hours of the drying cycle, comprising from ¼ to ½ of the drying cycle, in order to achieve a surface darkening without allowing any of the inner frozen product to melt or puff, and then deliberately reducing the pressure to below 300 microns of mercury for the remainder of the drying cycle.

4,138,503
METHOD OF MAKING A TUBULAR COLLAGEN CASING

Francis J. Ziolko, Somerville, N.J., assignor to Devro, Inc., Somerville, N.J.

Division of Ser. No. 541,465, Jan. 16, 1975, Pat. No. 4,060,361. This application Aug. 3, 1977, Ser. No. 821,450
Int. Cl.[2] A22C *13/00;* A23P *1/00*
U.S. Cl. 426—514 3 Claims

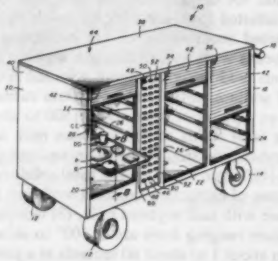


1. A method of making a tubular collagen casing comprising:
(a) directing an inner collagen gel and an outer collagen gel to an extruder;
(b) feeding the inner gel radially outwardly through a first group of radially extending orifices to form a plurality of inner gel ropes; (c) feeding the outer gel radially inwardly through a second group of radially extending orifices to form a plurality of outer gel ropes;
(d) bringing said radially inwardly directed outer gel and said radially outwardly directed inner gel together to form a fluid mass having a substantially annular cross section with the ropes from the outer gel being predominantly located adjacent the outer border of the annulus and the ropes from the inner gel being predominantly located adjacent the inner border of the annulus; and
(e) feeding the annular mass between two counter-rotating concentric surfaces to thereby direct said outer gel ropes and said inner gel ropes in opposite helical directions and form a two-layered tubular casing.

4,138,504
FOOD SERVICE METHOD

Anthony C. Mack, North Reading, and George K. Shumrak, Natick, both of Mass., assignors to Sweetheart Plastics, Inc., Wilmington, Mass.

Division of Ser. No. 596,969, Jul. 17, 1975, Pat. No. 4,068,115, which is a continuation-in-part of Ser. No. 468,404, May 9, 1974, Pat. No. 3,924,100. This application Jul. 22, 1977, Ser. No. 818,242
Int. Cl.[2] A23L *1/00*
U.S. Cl. 426—520 5 Claims



1. A method of serving food at diverse locations from a central location comprising the steps of
filling individual serving dishes with the food to be served,
providing individual trays each for a full service of dishes for one person and arranging the dishes on the trays,
selectively heating only portions of the trays that carry the dishes containing the food to be served at an elevated temperture to the exclusion of the other portions of the trays by placing said trays on a cart
having a self contained energy source to direct energy to the trays for the selective heating of only portions thereof, and transporting said cart from the central location to the diverse locations while maintaining said heating.

4,138,505
NUTRIENT COMPOSITIONS DERIVED FROM ANIMAL BLOOD SOLIDS AND PROCESS FOR PRODUCING SAME

James R. Hart, Meridian, and Patrick D. Brown, Boise, both of Id., assignors to Blue Wing Corporation, Boise, Id.

Filed Oct. 28, 1976, Ser. No. 736,411
Int. Cl.[2] A23K *1/04;* A23L *1/31*
U.S. Cl. 426—573 20 Claims

1. A process for producing a nutrient composition from animal blood comprising:
(a) heating an aqueous medium containing at least about 10 weight percent blood solids to a temperature in the range of from about 20° C. to about 60° C.;
(b) adjusting the pH of the heated aqueous medium to a pH level in the range of from about 8 to about 11;
(c) admixing an effective amount of a nutrient lipid into the heated pH adjusted aqueous medium to provide a dispersion containing a ratio of lipid to blood solids in the range of from about 0.1:1 to about 6:1, respectively;
(d) adjusting the pH of the resulting dispersion to a pH level in the range of from about 11.7 to about 13 to form a blood solids-lipid containing gel;
(e) dispersing from about 0.1 to about 6 weight percent, based upon the weight of the blood solids, of an aldehyde into said gel, said aldehyde being reactive with said blood solids; and
(f) recovering said gel.

4,138,506

METHOD FOR DEODORIZING SOYBEAN MILK OBTAINED FROM SOYBEANS OR DEFATTED SOYBEANS

Toshiaki Eida; Yasuhiro Saito; Tomiji Saito; Chobe Yomoto, all of Kanagawa, and Yutaka Nakajima, Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 635,836, Nov. 28, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,705

Int. Cl.[2] A23C *11/00;* A23L *1/20*

U.S. Cl. 426—598 5 Claims

1. A method for deodorizing soybean milk obtained from soybeans or defatted soybeans which consists essentially of the steps, conducted sequentially of (1) extracting soybeans or defatted soybeans with water to obtain soybean milk, (2) adding a sulfurous acid reducing agent selected from the group consisting of sodium sulfite and potassium sufite to said soybean milk in an amount of from about 1500 to about 4000 ppm based on the total solids of the soybean milk in the case of extracting soybeans in step (1) or in an amount of from about 200 to about 1000 ppm based on the total solids of the soybean milk in the case of extracting defatted soybeans in step (1), to form a mixture with said soybean milk, (3) heating the mixture at a temperature ranging from about 100° to about 160° C. for a period from about 1 to about 60 seconds at a pressure of from about 2 to about 6 Kg/cm^2 gauge, (4) quenching the heated mixture to a temperature of from about 15° to about 40° C., (5) contacting the cooled mixture with activated carbon to adsorb odorous components and remaining sulfurous acid reducing agent from said mixture, and (6) recovering said soybean milk.

4,138,507

COAGULATED EGG-WHITE FOODSTUFFS

Okinori Iimura, Tama, Japan, assignor to Kewpie Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1976, Ser. No. 742,502

Claims priority, application Japan, Jul. 5, 1976, 52-79587

Int. Cl.[2] A23L *1/32*

U.S. Cl. 426—614 10 Claims

1. A freeze-thaw stable, heat coagulated, frozen egg white food product consisting essentially of at least about 70% by weight of a coagulated egg white, 1 to 15% by weight of a water-combinable material, about 0.1 to 1.0% by weight of a viscosity increasing agent, and 2 to 15% by weight of a starch hydrolyzate, said each ingredient being based on the total raw materials.

4,138,508

PROCESS FOR PRODUCING PRESSURE-SENSITIVE TRANSFER SHEETS USING NOVEL RADIATION CURABLE COATINGS

Sydney M. Spatz, Circleville; Robert C. Hydell, and Gerald T. Davis, both of Chillicothe, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jun. 17, 1976, Ser. No. 697,019

Int. Cl.[2] B05D *3/06;* B41M *5/22*

U.S. Cl. 427—54 7 Claims

1. A process for producing a pressure-sensitive carbonless transfer sheet comprising:

(a) preparing a solution of a first chromogenic material, said solution of said first chromogenic material including at least one chromogenic compound dissolved in a carrier oil, said chromogenic material being present in said carrier oil in an amount of from about 0.5% to about 20% based on the weight of said solution of said first chromogenic material, said first chromogenic material being reactive with a second chromogenic material in the presence of said carrier oil to form a color, said first chromogenic material being selected from the group consisting of lactone phthalides and lactone fluorans and mixtures thereof;

(b) mixing said solution of said first chromogenic material with a liquid radiation curable substance to form a coating composition, said liquid radiation curable substance comprising a free radical polymerizable ethylenically unsaturated organic compound containing at least one terminal ethylenic group per molecule, said liquid radiation curable substance being curable to a frangible resin, said liquid radiation curable substance being compatible with the color-forming capabilities of said first chromogenic material, said solution of said first chromogenic material being present in said coating composition in an amount from about 17% to about 40% by weight of said coating composition;

(c) applying a film forming material to a substrate, said film forming material being settable to form a barrier layer which substantially prevents penetration of said substrate by said coating composition upon application of said coating composition to said substrate;

(d) setting said film forming material to form said barrier layer on said substrate;

(e) applying a film of said coating composition over said barrier layer; and

(f) curing said coating composition by subjecting said coating composition to radiation for a period of time sufficient to cure said coating composition containing said radiation curable substance to a frangible resinous film, said frangible resinous film being cured to a frangibility that will permit passage of said solution of said first chromogenic material to an exposed surface of said frangible resinous film when said frangible resinous film is broken.

4,138,509

SILICON PURIFICATION PROCESS

William M. Ingle, and Stephen W. Thompson, both of Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 23, 1977, Ser. No. 864,055

Int. Cl.[2] C01B *33/02, 33/08*

U.S. Cl. 427—86 5 Claims

1. A process for producing pure silicon which comprises the steps of:

chemically combining metallurgical grade silicon containing aluminum as an impurity and silicon tetrafluoride in the presence of silicon dioxide at a temperature greater than 1100° C. to form silicon difluoride gas;

forming an initial small quantity of polymers of said silicon difluoride gas including impurities present in said metallurgical grade silicon and said silicon difluoride gas at a first temperature between −45° C. and +200° C.;

forming an additional quantity of polymers of said silicon difluoride gas at a temperature lower than said first temperature, said additional quantity of polymers being substantially free of impurities present in said metallurgical grade silicon or said silicon difluoride gas;

thermally decomposing said additional quantity of polymers by slowly heating in the range from about +100° C. to about +300° C. to form liquid and gaseous binary silicon fluoride homologues;

heating said binary silicon fluoride homologues to a temperature between 400° C. and 950° C. to yield said pure silicon.

4,138,510

METAL ANODE FOR ELECTROCHEMICAL PROCESSING AND METHOD OF MAKING SAME

Konrad Koziol; Hans-Carl Rathjen, both of Rothenbach, Pegnitz, and Karl-Heinz Sieberer, Zirndorf near Nuremberg, all of Fed. Rep. of Germany, assignors to Firma C. Conradty, Fed. Rep. of Germany

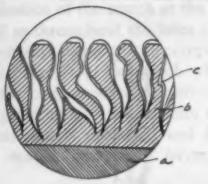
Division of Ser. No. 401,542, Sep. 27, 1973, Pat. No. 3,926,773, which is a continuation of Ser. No. 163,256, Jul. 16, 1971, abandoned. This application May 23, 1975, Ser. No. 580,222

Int. Cl.[2] C25B *11/02, 11/08*

U.S. Cl. 427—124 7 Claims

1. A method of making a valve metal anode, for electrolytical processes, having an electron-active cover layer, of suffi-

cient corrosion resistance during electrolysis, and possessing good electron conductivity in the potential ranges used, in which active substances, counteracting passivation, are anchored, the active substances being selected from the group consisting of metals and oxides of the platinum metal group,



mixed oxides of precious and ignoble metals and both, and oxides of ignoble metals alone, comprising the steps of providing, on a solid core of valve metal, a carrier layer of valve metal powder; sintering said valve metal powder in a non-oxidizing atmosphere; and impregnating the electron-active substances into the sintered, porous carrier layer.

4,138,511

METHOD OF PRODUCING GLOSSY OR FROSTED POWDER COATINGS

Rolf Rolles; James E. Williams, Jr., both of New Kensington, and Thomas J. Kondis, Pittsburgh, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 505,236, Sep. 12, 1974, abandoned, which is a division of Ser. No. 380,578, Jul. 19, 1973, Pat. No. 4,003,872. This application Apr. 30, 1976, Ser. No. 682,057

Int. Cl.[2] B05D *1/36, 7/00*

U.S. Cl. 427—201 **1 Claim**

1. A method of using a powder product consisting essentially of thermoplastic or thermosetting polymer based plastic particles and metal flake particles, the plastic particles being covered by the metal flake particles, which lie with their faces attached to the plastic particles, said method comprising applying said powder product to a surface and then melting the plastic particles, this being followed by subsequent solidification of the plastic as a coating on the surface, the quantity of metal flake particles in the powder product being such that coalescence is inhibited, whereby a rough, frosted metallic appearance is given to the surface.

4,138,512

PROCESS FOR CHEMICAL VAPOR DEPOSITION OF A HOMOGENEOUS ALLOY OF REFRACTORY METALS

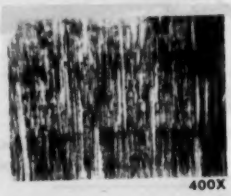
Fred A. Glaski, Chatsworth, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 17, 1977, Ser. No. 842,811

Int. Cl.[2] B05D *7/22*

U.S. Cl. 427—237 **3 Claims**

1. In a process of vapor depositing an alloy consisting essentially of refractory metals selected from the group consisting of tantalum, tungsten, molybdenum and niobium, on a substrate, wherein a coating of the alloy is deposited by reducing a mixture of the vapors of the refractory metal chlorides with hydrogen, the improvement which comprises generating the



mixture of the vapors of the metal chlorides by contacting an alloy of the refractory metals with gaseous chlorine and reacting the resulting mixture of vapors with gaseous hydrogen.

4,138,513

PROCESS FOR SURFACE PAINTING OF BODY PARTS FOR MOTOR VEHICLES CONSISTING OF SYNTHETIC PLASTIC MATERIAL

Rainer Srock, Leinfelden, and Hermann Ziegler, Renningen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 17, 1976, Ser. No. 742,667

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553482

Int. Cl.[2] B05D *1/38, 3/12, 7/02*

U.S. Cl. 427—371 **12 Claims**

1. A method for surface painting body parts of motor vehicles, wherein said body parts consist of synthetic plastic material, said method comprising the steps of:

(a) applying onto a body part a first layer of a filler comprising an epoxy resin and baking-in said first layer for about 60 minutes at about 80° C.;

(b) sanding the surface of said first layer to fine-finish the same;

(c) applying on the fine-finish first layer a second layer of an intermediate filler comprising an alkyd-melamine resin and baking-in said intermediate filler for about 15 minutes at a temperature of about 160° C.;

(d) sanding the surface of said second layer to fine-finish same; and

(e) applying as a third layer a cover paint comprising an alkyd-melamine resin and baking-in said third layer for about 30 minutes at a temperature of about 130° C.

4,138,514

PILE SURFACE RESEMBLING TURF AND METHOD OF MAKING IT

John M. Terpay, 528 River Oak Dr., Danville, Va. 24541

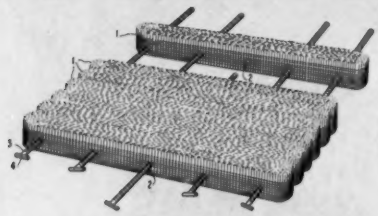
Filed May 25, 1978, Ser. No. 909,439

Int. Cl.[2] A41G *1/00*

U.S. Cl. 428—17 **10 Claims**

1. An artificial turf unit comprising superimposed, elongate layers of polymeric tape provided with a plurality of slits extending at least partially across the width of the tape said

layers having a plurality of series of holes substantially registered in each series for receiving tie rods for joining several



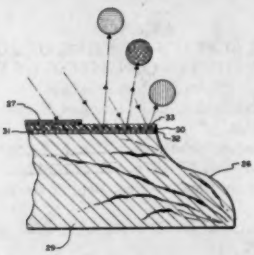
such units, and said layers being coalesced to each other at peripheral, marginal areas around said holes.

4,138,515

GEOMETRIC IRIDESCENT IMAGE

Emily C. Dial, 3802 S. 2850 East, Salt Lake City, Utah 84109

Filed Mar. 29, 1976, Ser. No. 671,265
Int. Cl.[2] B32B *3/30, 3/00*
U.S. Cl. 428—30 **8 Claims**



1. A composite laminate forming a geometric image wherein said laminate comprises a substrate having adhered thereon a flexible foil comprising a clear plastic having a grooved surface on its underside, said grooves being from about 5×10^{-5} to 25×10^{-3} of an inch apart and coated with a thin layer of light reflecting material of a thickness of between 0.5×10^{-6} and 1×10^{-6} inches, said foil being capable of dispersing and reflecting visible light into its component colors; and an overlying non-reflective layer adhered to the other side of said foil opposite said grooves which, in conjunction with the foil, produces the desired image.

4,138,516

PIPE COATING COMPOSITION

Oren L. Marrs; Robert E. Reusser, and Dale O. Tieszen, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 680,836, Apr. 28, 1976, Pat. No. 4,052,219. This application Aug. 8, 1977, Ser. No. 822,778
Int. Cl.[2] F16L *58/12*
U.S. Cl. 428—36 **9 Claims**

1. A coated pipe consisting essentially of a metal pipe having an exterior coating covering essentially the entire external surface of the pipe, said coating consisting essentially of

about 50 to 70 wt. % of a mineral aggregate,

about 5 to 20 wt. % of asphalt,

about 15 to 35 wt. % of a finely divided mineral filler, and

about 0.05 to 0.5 wt. % of synthetic organic fibers selected from the group consisting of polyester fibers, polyamide fibers, polyfluorocarbon fibers and poly(arylene sulfide) fibers.

4,138,517

ARTICLE OF ORNAMENTED CLOTHING AND METHOD OF ORNAMENTING THE SAME

Michael C. Gardner, 7004 SW. 46th St., Miami, Fla. 33155

Filed Mar. 30, 1978, Ser. No. 891,528
Int. Cl.[2] B32B *3/02*
U.S. Cl. 428—88 **10 Claims**

1. A decorative, cleanable fabric article, particularly an ornamented article of clothing, comprising:

(a) a limp flexible fabric panel;

(b) a film-forming adhesive coating applied to the fabric panel in a predetermined pattern, said coating having a solid plastic component and an evaporable liquid solvent component; and

(c) a mass of light-reflective particles randomly applied over the patterned coating, each particle having a generally flattened core of plastic material which is attackable by the solvent component and which has opposite major surfaces, and a light-reflective layer only on each major surface to thereby leave the respectively remaining border edge region uncoated and exposed to attack by the solvent component,

each border edge region being softened by solvation after contact has been made with the solvent and being slightly penetrated without substantially destroying the structural integrity of the respective particle, to thereby intermingle the solid plastic component of the coating with each plastic particle in contact therewith, and

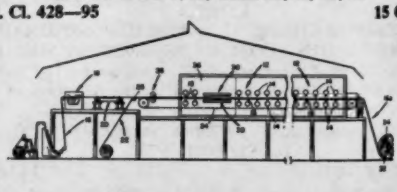
each particle forming a solid reinforced autogenous joint between the coating and each particle in intermingled relationship therewith after evaporation of the solvent component, the opposite sides of each autogenous joint being flanked by the light-reflective layers which thereby strengthen the respective joint and securely retain the particles on the article, particularly during cleaning of the same.

4,138,518

TEXTILE COMPOSITE AND METHOD FOR MAKING SAME

Emil G. Sammak; Douglas J. Ladish, both of Dover, Del.; John J. Martin, Hixon, Tenn., and Claire D. LeClaire, Dover, Del., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 634,013, Nov. 21, 1975, abandoned. This application Dec. 6, 1977, Ser. No. 857,905
Int. Cl.[2] B05D *3/02;* B32B *25/10, 25/16*
U.S. Cl. 428—95 **15 Claims**



1. A method of forming a textile composite comprising (A)

forming an aqueous latex composition consisting essentially of (1) from about 30 to about 90 phrs latex and (2) from about 70 to about 10 phrs granular starch, (B) applying said aqueous latex composition to a fabric substrate to form a textile composite and then (C) treating said textile composite to increase bonding strength by producing uniform and substantially complete gelatinization of the starch at the interface with the substrate as well as throughout the latex composition by increasing the temperature of the textile composite to above the gelatinization temperature of the starch while retaining sufficient moisture in the composition to gelatinize the starch by maintaining said gelatinization temperature until substantially complete gelatinization is produced and finally (D) completely drying the textile composite having improved bonding strength.

4,138,519

CONDUCTIVE SECONDARY BACKINGS AND TUFTED CARPETS MADE THEREWITH

Philip B. Mitchell, Smyrna, Ga., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 6, 1977, Ser. No. 830,889

Int. Cl.² D03D *15/02*

U.S. Cl. 428—95 **8 Claims**

1. A conductive secondary backing suitable for use in a tufted carpet comprising a fabric with an open construction of synthetic yarns and a conductive spun yarn, wherein said spun yarn comprises a conductive core fiber having a denier in the range of about 15 to about 25 and a maximum resistance of about 1×10^{10} ohms/centimeter around which is spun a non-conductive fiber having a denier in the range of about 3 to 18 with a twist of at least about 1¾ twists per inch.

4,138,520

TRANSLUCENT POLYPROPYLENE FILM AND PROCESS FOR PRODUCING THE SAME

Hiroshi Sato, Hiroshima; Munetsugu Nakatani, Ohtake; Hiroshi Nakatsui, Ohtake; Hideto Kakita, Ohtake; Hiroyuki Shimoyama, Ohtake; Naoki Mochida, Ohtake, and Shuichi Sugimori, Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1975, Ser. No. 635,373

Claims priority, application Japan, Nov. 29, 1974, 49-138620; Sep. 12, 1975, 50-111178; Sep. 16, 1975, 50-111883; Oct. 6, 1975, 50-120505

Int. Cl.² B32B *3/00*; B29C *17/00*

U.S. Cl. 428—141 **1 Claim**

1. A translucent polypropylene film containing no β-type crystallization nucleating agent, characterized in that the film has, on at least one side, a surface layer composed of a two- or three-dimensional network structure, in which network elements constituting the said network structure are present in a proportion of at least 1,000 per cm^2 of the film surface, and is quite dense in inner structure, and high in airtightness.

4,138,521

FLOORING MATERIALS

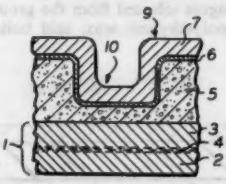
Robert Brown, Fife, Scotland, assignor to Nairn Floors Limited, Lancaster, England

Continuation-in-part of Ser. No. 632,039, Nov. 14, 1975, abandoned. This application May 14, 1976, Ser. No. 686,435

Int. Cl.² B32B *3/30, 17/02*

U.S. Cl. 428—159 **12 Claims**

1. A substrate for a decorative cushioned vinyl floor covering comprising a smooth non-woven tissue having a substantially uniform thickness of from 0.13 to 0.76 mm and weighing from 30 to 150 g/m^2 and consisting essentially of glass fibres 5 to 15 microns in diameter, bonded with from 10 to 30%, based on the total weight of tissue, of a synthetic binder and which has at least on one surface a continuous layer of vinyl resin impregnated at least partially into that surface, wherein the coated tissue has a smoothness of less than ± 0.06 mm after



heating and cooling without constraint and has thickness and weight deviations of ± 10%.

4,138,522

COLOR IMAGE FORMING SYSTEM INCLUDING A LAYER FORMED FROM A DRIED RESIDUE OF A DEVELOPING INK CONTAINING A POLYESTER RESIN BINDER

Akio Ishizuka, and Akio Miyamoto, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 506,811, Sep. 17, 1974, abandoned. This application Dec. 9, 1976, Ser. No. 748,859

Int. Cl.² B32B *3/00, 27/06, 27/10, 27/36*

U.S. Cl. 428—195 **15 Claims**

1. A color image forming system comprising the components

(a) an electron donating color former; and

(b) an electron accepting color developer, wherein said component (b) is in the form of a layer on a support, said layer being the dried residue of a coating of a developing ink comprising

(i) an electron accepting developer;

(ii) a thermoplastic linear polyester resin binder comprising the condensation product of at least one dicarboxylic acid having 2 to 18 carbon atoms and at least one dihydric alcohol having from 2 to 50 carbon atoms and having a molecular weight of about 5,000 to 50,000 and a melting point of about 90 to 170° C.; and

(iii) a liquid medium selected from the group consisting of an alcohol, an ester, an aromatic hydrocarbon and a glycol ether, said ink comprising about 10 to 50% by weight of said developer, about 5 to 45% by weight of said polyester resin binder and about 30 to 80% by weight of said liquid medium.

8. The color image forming system of claim 1, wherein said system is in the form of a support having

(i) component (b) as a layer upon a layer of component (a) which is coated upon said support;

(ii) component (a) as a layer upon a layer of component (b) which is coated upon said support; or

(iii) component (a) as a layer upon said support and component (b) as a layer upon the reverse side of said support.

4,138,523

FILM MATERIAL FOR FORMING BLACKBOARDS

Tadashi Katsurayama, Yokkaichi, and Yoshio Nakamuro, Kuwana, both of Japan, assignors to Suzuka Paint Manufacturing Company, Limited, Yokkaichi, Japan

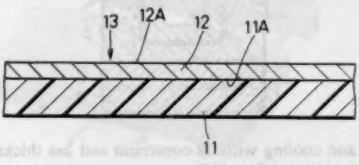
Filed Dec. 16, 1977, Ser. No. 861,301

Int. Cl.² B43L *21/00*; B32B *7/02*

U.S. Cl. 428—216 **10 Claims**

1. A flexible coated film material for forming a writable surface of a blackboard when attached to a base board, comprising a film selected from the group consisting of polyethylene and polypropylene, the film having a thickness of 0.04 to 1.00 mm, and a layer of polyurethane resin paint covering one surface of said film, the layer having a thickness of approximately 20 to 70 microns, the paint containing a bulking agent of

which approximately 85 to 95% by weight has a grain diameter of 7.5 to 20 microns and approximately 5 to 15% by weight has a grain diameter of 50 to 70 microns, the paint further containing a lubricating agent selected from the group consisting of silicone oil and polyethylene wax, said bulking agent and



lubricating agent being evenly distributed in the polyurethane resin paint, said polyurethane layer providing said writable surface and said lubricating agent being present in an effective amount to facilitate erasure of a written image on said writable surface.

4,138,524

STRUCTURAL ARTICLE WITH MOLDED PROTECTIVE EXPOSED SURFACE

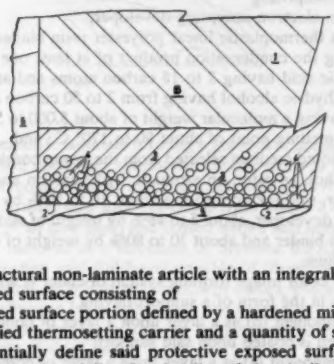
Lloyd R. Darroch, Auckland, New Zealand, assignor to Aakronite Decoratives Limited, New Zealand

Continuation of Ser. No. 581,200, May 27, 1975, abandoned, which is a continuation of Ser. No. 362,646, May 21, 1973, abandoned. This application Dec. 1, 1976, Ser. No. 746,280

Claims priority, application New Zealand, May 25, 1972, 167282

Int. Cl.[2] B29D *3/02*; B29F *1/10*; B32B *27/04*

U.S. Cl. 428—217 **4 Claims**



1. A structural non-laminate article with an integral protective exposed surface consisting of

a moulded surface portion defined by a hardened mixture of solidified thermosetting carrier and a quantity of solids to substantially define said protective exposed surface and consisting essentially of a plurality of chemically inactive spheroidal members substantially of 100 mesh size, concentrated in a settled pattern at said surface and characteristically hard in relation to said carrier; and

a non-surface support body integral with said moulded surface portion and extending between said spheroidal members, said body being defined substantially by a solid quantity of solidified thermosetting carrier that is less dense than said spheroidal members.

4,138,525

HIGHLY-HANDLEABLE PITCH-BASED FIBERS

David A. Schulz, Fairview Park, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 657,208, Feb. 11, 1976, abandoned, which is a division of Ser. No. 562,777, Mar. 27, 1975, Pat. No. 4,014,725. This application May 4, 1977, Ser. No. 793,512

Int. Cl.[2] B32B *9/00*; B29C *25/00*; D02G *3/00*

U.S. Cl. 428—367 **24 Claims**

17. Carbonaceous fiber prepared by oxidizing a pitch fiber having a mesophase content of from 40 per cent by weight to 90 per cent by weight to an oxygen content of from 17 per cent by weight to 30 per cent by weight, said fiber having a tensile strength of at least 30,000 psi. and a strain-to-failure of at least 5 per cent.

4,138,526

PROCESS FOR PRODUCING GOOD ADHERENCE BETWEEN A METAL AND POLYSULPHIDE MATERIAL AND ARTICLES PRODUCED THEREBY

Thor Børresen, Strandgaten 30, 3190, Horten, Norway, and Niels U. Harder, Kokkedal, Denmark, assignors to Thor Børresen, Norway

Filed Dec. 21, 1976, Ser. No. 753,089

Claims priority, application Norway, Dec. 22, 1975, 75436; Denmark, Sep. 30, 1976, 4408/76

Int. Cl.[2] B32B *27/06*

U.S. Cl. 428—419 **9 Claims**

1. In a process for producing a strong and water-resistant bond between aluminum or an aluminum-based alloy and a polysulphide material by means of a primer applied to the metal which comprises coating the aluminum or aluminum-based alloy with a primer, drying the primer, applying a polysulphide material to the metal coated with the primer and permitting the polysulphide coated on the metal to cure; the improvement wherein the primer is applied to the aluminum or aluminum-based alloy and dried without rinsing, prior to the application of the polysulphide thereto and wherein the primer is a solution consisting essentially of a strongly basic alkali metal compound.

4,138,527

SHEET OR WEB TYPE MATERIALS WITH A MARKABLE ADHESIVE-REPELLENT COATING, AND A PROCESS FOR THEIR MANUFACTURE

Wasfi N. Malek, Hamburg, Fed. Rep. of Germany, assignor to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Jun. 17, 1977, Ser. No. 807,720

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629535

Int. Cl.[2] B32B *27/40*; B05B *5/04*

U.S. Cl. 428—425 **20 Claims**

1. A self-adhesive web or sheet material, which comprises a flexible substrate coated on at least one side with a markable adhesive-repellent coating said coating having been produced by heating a solvent-containing mixture consisting essentially of an organic solvent,

44 to 84 parts wt. of (a) a non-reactive, organic solvent-soluble, linear polyurethane resin or (b) a polyurethane resin containing hydroxypolyester groups, having a hydroxyl content of about 0.1%,

1 to 16 parts by wt. of an aliphatic trifunctional isocyanate containing terminal isocyanate groups,

1 to 14 parts by wt. of glycerin,

0 to 40 parts by wt. of a micro-fine siliceous matting agent,

0 to 1 part by wt. of an organic tin ester catalyst.

10. A process for the manufacture of sheet or web type self-adhesive materials coated on at least one side of a flexible substrate with a markable adhesive-repellent coating, said adhesive-repellent coating being applied in the form of a solvent-containing mixture consisting essentially of an organic solvent,

44 to 84 parts by wt. of (a) a non-reactive, organic solvent-soluble, linear polyurethane resin or (b) a polyurethane resin containing hydroxypolyester groups having a hydroxyl content of about 0.1%,

1 to 16 parts by wt. of an aliphatic trifunctional isocyanate containing terminal isocyanate groups,

1 to 14 parts by wt. of glycerin,

0 to 40 parts by wt. of a micro-fine siliceous matting agent,

0 to 1 part by wt. of an organic tin ester catalyst,

comprising the steps of applying a thin layer of said solvent-containing mixture on a support, drying said support, heating said support whereby said adhesive-repellent coating is formed by the reaction of the components of said solvent-containing mixture.

4,138,528

ARTICLES COATED WITH AN AMINOPLAST POLYFUNCTIONAL RESIN COMPOSITION

Frank J. Hahn, Wilbraham, and James O. Santer, East Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 572,037, Apr. 28, 1975, Pat. No. 4,031,057. This application Apr. 11, 1977, Ser. No. 786,171

Int. Cl.² B32B 27/06, 27/00

U.S. Cl. 428—482 **4 Claims**

1. An article of manufacture comprising a substrate coated with a cured film of a resin composition comprising N,N'-bis-(alkoxymethyl) uron and a polyfunctional resin in the weight ratio of 30:70 to 70:30, wherein the alkyl radicals of the alkoxy groups of the uron are selected from the group consisting of C_1 to C_6 alkyl radicals and wherein the polyfunctional resin contains sufficient alcoholic hydroxyl and carboxyl groups to provide a functionality greater than 2 and has a number average molecular weight in the range of 300 to 5000.

4,138,529

PHOSPHORS AND X-RAY IMAGE CONVERTERS USING THE SAME

Etsuo Mori, Odawara; Keiji Shimiya, Hiratsuka; Norio Miura, Isehara, and Yujiro Suzuki, Odawara, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Jun. 16, 1977, Ser. No. 807,177

Claims priority, application Japan, Jun. 25, 1976, 51-75267; Jun. 25, 1976, 51-75268; Jun. 25, 1976, 51-75270; Oct. 8, 1976, 51-120895; Oct. 8, 1976, 51-120896; Oct. 14, 1976, 51-123288

Int. Cl.² C09K 11/46

U.S. Cl. 428—539 **8 Claims**

1. A complex halide phosphor represented by the composition formula

$$MeF_2 \cdot aMe'X_2 \cdot bKX' \cdot cMe''SO_4 : dEu^{2+}$$

wherein Me, Me' and Me'' each represents at least one of the alkaline earth metals of the group consisting of barium, strontium and calcium; X and X' each represents at least one of chlorine and bromine; and a, b, c, and d are numbers defined as follows:

$$0.30 \leqq a \leqq 1.50,\ 0.10 \leqq b \leqq 2.00,\ 0.01 \leqq c \leqq 1.00,$$
$$0.001 \leqq d \leqq 0.20.$$

4,138,530

MAGNETIC STRUCTURES

Dirk J. Breed; Antonius B. Voermans, and Hans Logmans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

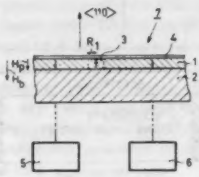
Filed Jun. 27, 1977, Ser. No. 810,105

Claims priority, application Netherlands, Jan. 17, 1977, 7700419

Int. Cl.² G11C 11/02

U.S. Cl. 428—539 **6 Claims**

1. A magnetic structure suitable for the high velocity propagation of single-wall magnetic domains in the structure comprising a monocrystalline non-magnetic substrate having a lattice constant a_1 and having a surface bearing a layer of a monocrystalline magnetic material of the composition $R_3Fe_{5-y}M^{3+}{}_yO_{12}$, R being a rare earth including yttrium, M is manganese or ruthenium and $y \geqq 0.15$, the Mn^{3+} and/or Ru^{3+} ions being substituted in iron lattice sites, and having a lattice constant a_2 which layer has been grown in compression on a surface of the substrate with an easy axis of magnetization substantially normal to the plane of the layer and with a medium axis of magnetization in the plane of the layer, the said surface of



the substrate extending substantially parallel to a {110} face of the substrate.

4,138,531

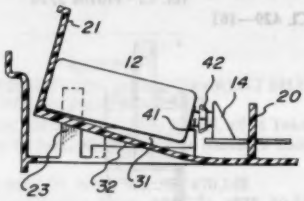
BATTERY HOLDER FOR A CONTROL DEVICE

Maynard L. Thompson, Scott, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Dec. 27, 1977, Ser. No. 864,189

Int. Cl.² H01M 2/10

U.S. Cl. 429—98 **4 Claims**



1. A battery holder being an integral part of a base of a control device comprising,

a base of a control device,

a first stationary member attached to said base and projecting outward therefrom,

a second stationary member attached to said base and projecting outward therefrom, said second member being flexible to allow for movement of said second member with respect to said first member, and

battery connection means adapted to cooperate with at least one terminal on a battery, said connection means being attached to one of said members in between said first and second members whereby upon placing a battery between said members, a force applied to move said second member toward said first member connects the terminal of the battery to said connection means.

4,138,532

N-METHYLPHENAZINE PHOTOGALVANIC CELL

Schoen-nan Chen, North Brunswick, N.J., assignor to Optel Corporation, Princeton, N.J. and Grumman Aerospace Corporation, Bethpage, N.Y., part interest to each

Filed Nov. 11, 1976, Ser. No. 740,875

Int. Cl.² H01M 6/30, 6/36

U.S. Cl. 429—111 **4 Claims**

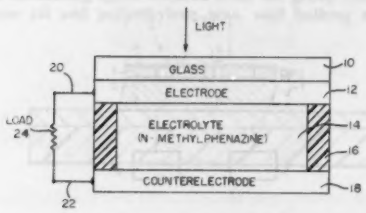
1. A photogalvanic cell comprising:

a light transmissive semiconductor electrode;

a counterelectrode;

an electrolyte contained between the electrode and the counterelectrode, the electrolyte incorporating a dye system which includes N-methylphenazinium ions in an acid medium, having a spectral sensitivity ranging from 500 nm down to the ultra-violet region;

means contacting the electrodes for drawing current from the cell as light irradiates the cell, said dye system further



providing means for storing electrical energy within said cell for delivery after termination of irradiation.

4,138,533

LEAD ACCUMULATOR

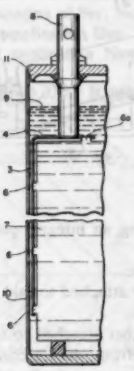
Hans Steig, Hauptlinderweg 7, 4770 Soest, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,223

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621381

Int. Cl.[2] H01M *2/28*

U.S. Cl. 429—161 **7 Claims**



1. In a lead accumulator of tall constructional form comprising plate electrodes, each electrode having current lugs on the side edges of the plate and current lugs being spaced from one another, and a pole plate constituting a current conductor of high electrical conductivity mechanically and electrically connecting together the current lugs of the plate electrodes of the same polarity and arranged along the side edges of the plate electrodes, the improvement comprising said plate electrodes having current lugs on two adjacently positioned side edges of each plate and said pole plate shaped to closely conform to the configuration of said adjacent side edges, said pole plate provided with openings which generally correspond in cross-section with said current lugs, said lugs being mechanically received in said openings and electrically connected to said pole plate.

4,138,534

PRODUCTION OF STRUCTURAL MEMBERS FROM RECLAIMED POLYOLEFINS

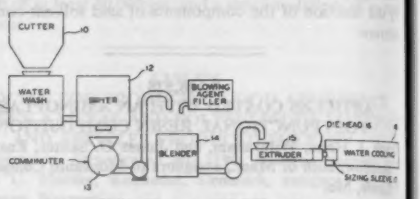
Francis A. Tedesco, Chicago, Ill., assignor to Lifetime Foam Products, Inc., Franklin Park, Ill.

Filed Feb. 7, 1977, Ser. No. 759,717

Int. Cl.[2] C08V *9/06*

U.S. Cl. 521—79 **7 Claims**

1. As a new article of manufacture, a cellular shaped structural member constituting between 25 and 100% of a polyolefin resin reclaimed from discarded lead-acid storage battery casings, said reclaimed polyolefin containing about 0.001 -



0.003% lead compounds and about 0.05 – 0.15% sulfur compounds.

4,138,535

NITRITE ESTERS OF POLYHYDROXY POLYMERS

Richard G. Schweiger, 1324 Rimrock Dr., San Jose, Calif. 95120

Division of Ser. No. 669,483, Mar. 23, 1976, Pat. No. 4,035,569, which is a continuation of Ser. No. 487,196, Jul. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 298,580, Oct. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 40,442, May 25, 1970, Pat. No. 3,702,843. This application Apr. 18, 1977, Ser. No. 788,411

Int. Cl.[2] C08B *5/00, 3/06, 37/00*; C08F *8/30*

U.S. Cl. 526—7 **20 Claims**

1. A polysaccharide or polyvinyl alcohol containing a mixture of nitrite ester groups with sulfate or nitrate ester groups with said nitrite ester groups and said sulfate or nitrate ester groups being substantially uniformly distributed among the polymer units in said polysaccharide or polyvinyl alcohol and the degree of substitution of said nitrite ester groups being at least about 0.1.

12. A nitrite ester of a polysaccharide which is starch, a starch fraction, guar gum or locust bean gum with said nitrite ester having a degree of substitution of about 2.0 to 3.0.

13. A nitrite ester of polyvinyl alcohol having a degree of nitrite substitution of about 0.1 to 1.0.

14. A nitrite ester of guar gum having a degree of nitrite ester substitution of about 0.1 to 2.0.

4,138,536

POLYMERIZATION OF 1,3-CYCLODIENE WITH VINYLAROMATIC HYDROCARBON

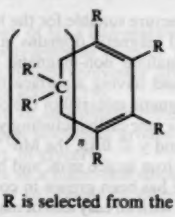
Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 751,861, Dec. 20, 1976, abandoned, which is a continuation of Ser. No. 583,721, Jun. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 449,642, Mar. 11, 1974, abandoned. This application Nov. 15, 1977, Ser. No. 851,649

Int. Cl.[2] C08F *4/08, 8/04, 212/08, 232/06*

U.S. Cl. 526—19 **44 Claims**

1. A method for the production of a 1,3-cyclodiene/-vinylaromatic copolymer which comprises polymerizing a 1,3-cyclodiene comonomer and a vinylaromatic hydrocarbon comonomer in a reaction mixture comprising the 1,3-cyclodiene comonomer represented by the formula



wherein n is 1 or 2, R is selected from the group consisting of

a hydrogen, methyl or ethyl radical and R′ is selected from the group consisting of a hydrogen, alkyl, cycloalkyl, and aryl radical with a maximum of 6 carbon atoms per R′ group;

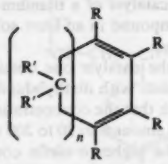
the vinylaromatic hydrocarbon comonomer of from about 8 to 14 carbon atoms per molecule;

a diluent, wherein the diluent is selected from the group consisting of linear and branched paraffin and cycloparaffin hydrocarbons of 4 to 12 carbon atoms per molecule and wherein the diluent is present in an amount sufficient to produce an increase in conversion as compared to the conversion produced when toluene is used as the diluent;

an organolithium initiator; and

optionally an ether or a tetiary amine.

1. A method for the production of a 1,3-cyclodiene/-vinylaromatic copolymer which comprises polymerizing a 1,3-cyclodiene comonomer and a vinylaromatic hydrocarbon comonomer in a reaction mixture consisting essentially of the 1,3-cyclodiene comonomer represented by the formula



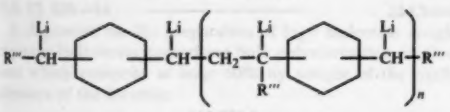
wherein n is 1 or 2, R is selected from the group consisting of a hydrogen, methyl or ethyl radical and R′ is selected from the group consisting of a hydrogen, alkyl, cycloalkyl, and aryl radical with a maximum of 6 carbon atoms per R′0 group;

the vinylaromatic hydrocarbon comonomer of from about 8 to 14 carbon atoms per molecule;

a diluent selected from the group consisting of 2,3-dimethylbutane, n-heptane, methylcyclopentane, 2,2,4-trimethylpentane and cyclohexane;

an organolithium initiator represented by the formula $R''Li_x$ wherein R″ is selected from the group consisting of an aliphatic, alicyclic and aromatic radical of from 1 to 20 carbon atoms per radical, x is an integer of from 1 to 4 and the valence of R″ is equal to x; or

an organolithium initiator represented by the formula

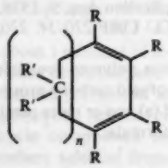


wherein R‴ is a linear or branched alkyl containing 2 to 12 carbon atoms, and n is an integer from 0 to 2; and

optionally an ether or a tertiary amine.

24. A 1,3-cyclodiene/vinylaromatic copolymer produced by polymerizing a reaction mixture consisting essentially of

a 1,3-cyclodiene represented by the general formula



wherein n is 1 or 2, R is selected from the group consisting of a hydrogen, methyl or ethyl radical and R′ is selected from the group consisting of a hydrogen, alkyl, cycloalkyl, and aryl radical with a maximum of 6 carbon atoms per R′ group;

a vinylaromatic hydrocarbon of from about 8 to 14 carbon atoms per molecule;

a polymerization initiator wherein the ratio by weight of vinylaromatic hydrocarbon in the polymerization mixture to 1,3-cyclodiene ranges from about 99:1 to 1:99; and

optionally an ether or a tertiary amine in an amount in the range of from about 0.01 to 50 phm;

optionally a polymerization diluent selected from the group consisting of linear and branched paraffin and cycloparaffin hydrocarbons of 4 to 12 carbon atoms per molecule;

wherein said polymerization initiator consists essentially of an organolithium initiator having a lithium functionality greater than 1, and said copolymer has improved tensile strength as compared to such copolymers produced employing organolithium initiators having a lithium functionality equal to 1.

4,138,537

PEROXIDE VULCANIZED W-TYPE CHLOROPRENE

Ronald J. Dembowski, Muncie, and David O. Werbil, Indianapolis, both of Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Mar. 1, 1977, Ser. No. 773,226

Int. Cl.[2] C08F *8/00, 8/06, 8/42*

U.S. Cl. 526—47.8 **14 Claims**

1. An antioxidant-free vulcanizable composition comprising W-type polychloroprene and a vulcanizing amount of a vulcanizing agent consisting essentially of a β-substituted diperoxyketal selected from the group consisting of 2,2-bis-(t-butyl peroxy) butane and 1,1-bis-(t-butyl peroxy)-3,3,5-trimethyl cyclohexane.

4,138,538

PROCESS FOR PRODUCING A TRANSPARENT SHAPED POLYMERIC PRODUCT

Isao Kaetsu; Hiroshi Okubo, and Fumio Yoshii, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Mar. 24, 1976, Ser. No. 670,169

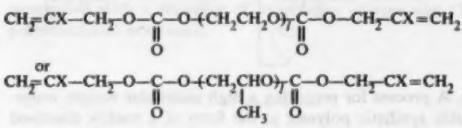
Claims priority, application Japan, Mar. 26, 1975, 50-35374

Int. Cl.[2] C08F *2/54, 236/20*

U.S. Cl. 526—73 **10 Claims**

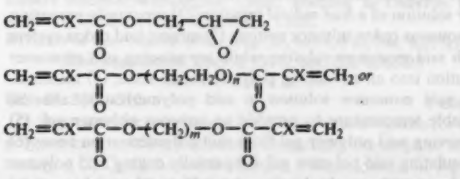
1. A process for efficiently producing a transparent shaped polymeric product, free from defects such as bubbles and strain, of sufficiently high mechanical strength, surface hardness, weather resistance, and impact resistance to serve as a substitute for inorganic glass, consisting essentially of the steps of: mixing

(A) one or more compounds represented by the formula



wherein X is H or CH_3 and l is an integer of from 1 to 4, or a prepolymer thereof, in an amount of from 30 to 80% by weight,

(B) one or more compounds represented by the formula



wherein X is H or CH_3, n is an integer of 2, 3 or 4 and m is an integer of from 3 to 6, or a prepolymer thereof, in an amount of from 70 to 20% by weight based on the total amount of (A) and (B), and

(C) a radical polymerization catalyst in an amount of from 0.5 to 5 parts by weight per 100 parts of the total amount of (A) and (B);

pouring the mixture into a cell or mold adapted to cast polymerization;

irradiating it with light of ionizing radiation at a temperature below room temperature to subject it to cast polymerization; and then

heating it to a temperature ranging from 80° C. to the decomposition temperature of the copolymer to be produced to complete the polymerization.

4,138,539

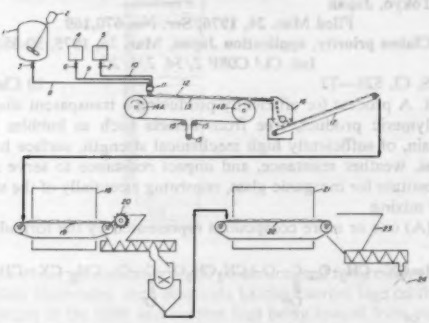
PROCESS FOR WATER-SOLUBLE SYNTHETIC POLYMER IN POWDER FORM

Paul H. Landolt, Mountain Lakes, and Louis N. Allen, Short Hills, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 19, 1975, Ser. No. 588,460

Int. Cl.[2] C08F *6/00, 4/40*

U.S. Cl. 526—93 **10 Claims**



1. A process for preparing a high molecular weight water-soluble synthetic polymer in the form of a readily dissolved powder which process comprises: (1) preparing an aqueous monomer solution comprising water, from about 20 to 50 weight percent of a water-soluble ethylenically unsaturated monomer providing a water-soluble polymer, based on the total weight of water and monomer, and from about 100 to 2,000 parts per million based on the total weight of said monomer solution of a free radical initiator; (2) separately preparing an aqueous redox initiator system; (3) mixing said redox system with said monomer solution while introducing said monomer solution into an advancing polymerization zone; (4) maintaining said monomer solution in said polymerization zone at suitable temperature to provide an aqueous polymer gel; (5) removing said polymer gel from said polymerization zone; (6) granulating said polymer gel; (7) partially drying said polymer gel to provide a cake having about 25 to 45 weight percent water; (8) breaking the partially dried polymer cake to provide granules; (9) further drying the granules to reduce the water content to less than about 15 weight percent; and (10) pulverizing the thus-dried polymer.

4,138,540

PROCESS FOR THE MANUFACTURE OF HIGH MOLECULAR COPOLYMERISATES OF ETHYLENE

Siegfried Lutze, Gelsenkirchen; Peter Schneller, Oberhausen; Hans-Walter Birnkraut, Oberhausen; Josef Berzen, Oberhausen, and Günter Hetkamp, Dinslaken, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Apr. 28, 1977, Ser. No. 792,074

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621404

Int. Cl.[2] C08F *4/64, 210/16*

U.S. Cl. 526—159 **8 Claims**

1. In a process for the manufacture of a high molecular weight copolymer of ethylene with a higher α-olefin comonomer wherein ethylene and the comonomer are contacted under Ziegler polymerization conditions comprising a temperature of 20 to 150° C. and a pressure up to 50 bar with a Ziegler catalyst comprising a mixed catalyst of a titanium-(III)-halide and an organoaluminum compound in an inert solvent, the improvement which comprises:

A. employing as the catalyst one obtained by reducing a titanium-(IV)-halide with diethylaluminum chloride in an inert solvent such that the concentration of titanium-(III)-halide so formed amounts to 30 to 200 m mol/liter solvent;

B. employing as the higher α-olefin comonomer 0.05 to 5 weight percent, based on the weight of ethylene, of an α-olefin having 3 to 20 carbon atoms; and

C1. contacting the catalyst first with α-olefin in the absence of ethylene and thereafter contacting said catalyst with ethylene; or

C2. intially contacting said catalyst with a mixture of said α-olefin and ethylene.

5. A high molecular weight ethylene-C_{3-20} α-olefin copolymer which can be molded to an article at room temperature which article when pressure-free tempered at 120 to 250° C. followed by cooling possesses an ultimate tensile strength of more than 200 kg/cm^2 measured at 120° C. and an impact strength of more than 200 kg cm/cm^2 measured at 23° C.

4,138,541

SELF-CURING COPOLYMERS CONTAINING BOTH HYDROXYAMIDE FUNCTIONS AND CARBOXY OR ANHYDRIDE FUNCTIONS, AND COMPOSITIONS

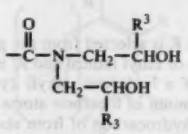
Harry J. Cenci, Warminster, and Graham Swift, Bluebell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 454,645, Mar. 25, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 713,081

Int. Cl.[2] C08F *220/54, 220/58*

U.S. Cl. 526—303 **6 Claims**

1. A curable addition polymer containing (a) one or more carboxy groups, salts of said carboxy groups or carboxylic acid anhydride groups and (a) one or more pendant β-hydroxyalkyl amide groups of the formula:



wherein R^3 is H or CH_3.

4,138,542

POLYMERS WHICH CONTAIN 2-(4-METHYL-CYCLOHEX-3-EN-1-YL)-PROPYL-N-ACRYLAMIDE OR -N-METHACRYLAMIDE GROUPS

Hardo Siegel, Speyer, and Herbert Naarmann, Wattenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

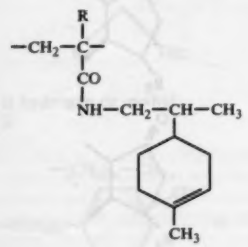
Filed Apr. 28, 1978, Ser. No. 901,236

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722956

Int. Cl.[2] C08F *20/54*

U.S. Cl. 526—305 2 Claims

1. A polymer which has a K value of from 20 to 140 and which comprises structural units of the general formula



where R is H or CH_3.

4,138,543

POLYMERIZATION OF ORGANOPOLYSILOXANES

Michel Bargain, Lyon, and Claude Millet, Saint-Priest, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 25, 1977, Ser. No. 800,391

Claims priority, application France, May 31, 1976, 76 17170

Int. Cl.[2] C08G *77/04*

U.S. Cl. 528—14 22 Claims

1. A process for the preparation of high molecular weight organopolysiloxanes comprising bulk polymerization of siloxanes which comprise at least 50% by weight of the cyclic siloxanes of the formula:

$$-R_1R_2Si-O-_n$$

wherein "n" represents an integer which is at least 4, "R_1" is a hydrocarbon radical containing from 1 to 12 carbon atoms, which may be unsubstituted or substituted by one or more members selected from the group consisting of halogen, amino and cyano, and "R_2" is either the "R_1" radical or —OR_3, wherein "R_3" is either hydrogen or the "R_1" radical, in the presence of:

(a) about 0.005 to about 1 millimol of an alkaline catalyst per 100 g of the siloxane employed; and

(b) from 0.05 to 5 mols, per mol of alkaline catalyst, of a monocyclic or polycyclic heterocycle compound or mixture of heterocycle compounds, comprising at least 3 heterocycle members selected from the groups —O—, —S—,

or —NH—, and having from 9 to 60 carbon atoms, the heterocycle members being interconnected via hydrocarbon groups comprising at least two carbon atoms.

4,138,544

PREPARATION OF POLYCONDENSATE BY ONE-STEP MELT CONDENSATION IN A VACUUM

Paul Janssen, deceased, late of Bensberg-Refrath, Fed. Rep. of Germany (by Almuth Janssen, legal representative); Günther Meyer, Troisdorf-Sieglar, Fed. Rep. of Germany; Klaus Thewalt, Witten-Bommern, Fed. Rep. of Germany, and Reinhard Schmidt, Witten, Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,916

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557580

Int. Cl.[2] C08G *63/34*

U.S. Cl. 528—272 26 Claims

1. In a method of preparing a linear polycondensate of high molecular weight wherein a precondensate is initially formed and thereafter subjected to an one-step melt condensation in a vacuum while cleavage products are removed therefrom, the reaction mass being exposed in a thin layer by means of a stirrer to the reaction conditions, the improvement which comprises employing as the precondensate a molten precondensate having an average condensation degree of at least 3, said precondensate being introduced into an one-step melt condensation zone continuously while the cleavage products are driven off at 240–280° C., specially 245–255° C., the contents of said melt condensation zone being subjected to the action of a rotary stirrer until the melt has a melt viscosity of 1000 to 15000 poises and continuously withdrawing molten polycondensate in accordance with the speed of the reaction.

4,138,545

OXAZOLIDINE-TERMINATED POLYESTERS

William D. Emmons, Huntingdon Valley, and Travis E. Stevens, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 4, 1978, Ser. No. 866,885

Int. Cl.[2] C08G *63/68*

U.S. Cl. 528—289 29 Claims

1. A hydrocurable composition comprising (1) a polyester terminated with a plurality of oxazolidine groups and (2) a polyfunctional isocyanate.

4,138,546

CATALYST PREPARATION FOR THE POLYMERIZATION OF PYRROLIDONE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 607,845, Aug. 25, 1975, Pat. No. 4,075,182. This application Dec. 2, 1977, Ser. No. 856,824

Int. Cl.[2] C08G *69/24*

U.S. Cl. 528—312 1 Claim

1. A process for preparing a catalyst-activator system for the polymerization of 2-pyrrolidone comprising the steps of contacting a C_1-C_2 alkali metal alkoxide with an excess of 2-pyrrolidone to form a 2-pyrrolidone solution comprising the alkali metal pyrrolidonate catalyst and a C_1-C_2 alcohol, passing an inert gas through said solution at a temperature of about 90° C. to about 200° C. to remove said alcohol, and contacting said solution with carbon dioxide, as an activator, to form said catalyst-activator system.

4,138,547
PROCESS FOR PREPARING 1,2,4-TRIAZOLE NUCLEOSIDES

Leon F. Christensen, Orem, Utah, and Joseph T. Witkowski, Morris Township, Morris County, N.J., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Filed Dec. 22, 1977, Ser. No. 863,293
Int. Cl.[2] C07H *17/00, 19/06*
U.S. Cl. 536—23 4 Claims

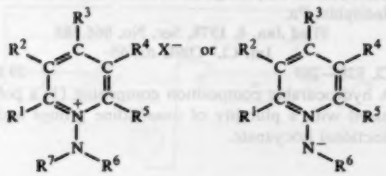
1. A process for preparing 1-B-D-ribofuranosyl-1,2,4-triazole-3-carboxamide which comprises reacting cyanoformimidic acid hydrazide with ribose which is blocked with a blocking group chosen from the group consisting of isopropylidene, benzylidene, p-methoxybenzylidene, ethoxymethylene or 2,3-cyclic carbonate to from N'-(blocked ribofuranosyl)-cyanoformamidrazone which is ring closed with a one carbon atom donating reagent chosen from the group consisting of triethylorthoformate, aceticformic anhydride, dimethoxymethyl acetate, formic acid-foramide, dimethylforamide dimethyl acetal or dimethylforamide-phosphoryl chloride, to form 3-cyano-1-(blocked-B-D-ribofuranosyl)-1,2,4-triazole which is treated with ammonia to remove the blocking group to yield the product.

4,138,548
ACARICIDAL PYRIDINIUM SALTS

John H. Parsons, Saffron Walden, England, assignor to Fisons Limited, England

Division of Ser. No. 780,348, Mar. 23, 1977, which is a division of Ser. No. 545,700, Jan. 30, 1975, Pat. No. 4,025,632, which is a division of Ser. No. 321,476, Jan. 5, 1973, Pat. No. 3,886,171. This application Jun. 16, 1977, Ser. No. 807,324
Claims priority, application United Kingdom, Jan. 5, 1972, 369/72
Int. Cl.[2] C07D *31/44*
U.S. Cl. 542—421 6 Claims

1. A compound of the general formula



(I) (II)

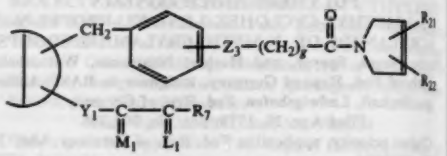
in which
R^1, R^2, R^3, R^4 and R^5 are the same or different and each represents hydrogen or alkyl of 1 to 4 carbon atoms;
R^6 represents a group of formula COR^{10} in which R^{10} represents styryl substituted by halogen;
R^7 represents hydrogen, alkyl of 1 to 4 carbon atoms or benzoyl substituted by halogen; and
X^- represents one equivalent of an anion.

4,138,549
INTER-PHENYLENE-PG PYRROLINYLAMIDES

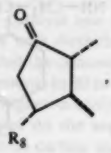
Walter Morozowich, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

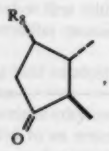
Continuation-in-part of Ser. No. 788,455, Apr. 18, 1977, Pat. No. 4,100,192. This application Apr. 20, 1978, Ser. No. 898,225
Int. Cl.[2] C07C *177/00*
U.S. Cl. 542—426 50 Claims

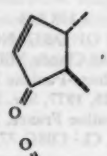
1. A prostaglandin analog of the formula

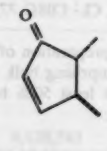


wherein D is









wherein
R_8 is hydrogen or hydroxy;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—, or
(3) $—CH_2CH_2—$,
wherein g is one, 2, or 3;
wherein Z_3 is oxa or methylene, with the proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein L_1 is

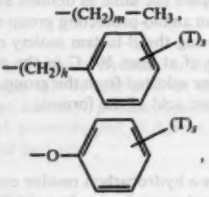
or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is

or

wherein R_5 is hydrogen or methyl;
wherein R_7 is



(1)
(2)
(3)

wherein h is zero to 3, inclusive, wherein m is one to 5, inclusive, s is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl; and
wherein R_{21} and R_{22} are
(i) hydrogen
(ii) alkyl of one to 12 carbon atoms, inclusive;
(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(iv) aralkyl of 7 to 12 carbon atoms, inclusive;
(v) phenyl;
(vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(vii) carboxyalkyl of one to 4 carbon atoms, inclusive;
(viii) carbamoylalkyl of one to 4 carbon atoms, inclusive;
(ix) cyanoalkyl of one to 4 carbon atoms, inclusive;
(x) acetylalkyl of one to 4 carbon atoms, inclusive;
(xi) benzoylalkyl of one to 4 carbon atoms, inclusive;
(xii) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(xiii) pyridyl;
(xiv) pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;
(xv) pyridylalkyl of one to 4 carbon atoms, inclusive;
(xvi) pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive;
(xvii) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(xviii) dihydroxyalkyl of one to 4 carbon atoms; or
(xix) trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl.

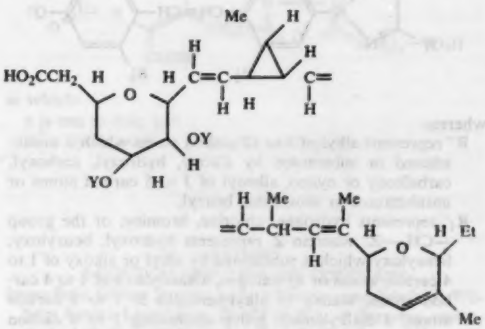
4,138,550

DIACYLOXYACIDS DERIVED FROM ACID S, AN ANTIBIOTIC PRODUCED BY *POLYANGIUM CELLULOSUM* VAR. *FULVUM*

David T. Connor, Parsippany; Samuel M. Ringel, Rockaway; Sidney Roemer, Flanders, and Maximillian Von Strandtmann, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 693,400, Jun. 7, 1976, abandoned. This application Feb. 4, 1977, Ser. No. 765,568
Int. Cl.² C09B *23/00*
U.S. Cl. 542—430 **5 Claims**

1. A compound having the formula I:



wherein Y is an acyl group derived from formic acid or derived from a lower alkyl carboxylic acid having from 3 to 7 carbon atoms.

4,138,551

SPECTRAL SENSITIZATION OF PHOTOGRAPHIC MATERIAL AND NEW SPECTRAL SENSITIZERS

Rolf Steiger, Praroman; Jean-Francois Reber, Marly, both of Switzerland; Aaron D. Ezekiel, Sevenoaks, and Geoffrey E. Ficken, Ilford, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 665,981, Mar. 11, 1976, Pat. No. 4,040,825. This application Mar. 25, 1977, Ser. No. 781,383
Claims priority, application United Kingdom, Mar. 18, 1975, 11187/75; Switzerland, Apr. 16, 1975, 4847/75; Feb. 20, 1976, 2100/76
Int. Cl.² C09B *23/06, 23/04*
U.S. Cl. 542—435 **5 Claims**

1. A spectral sensitising dinuclear cyanine dye which has attached either to a heterocyclic nucleus of the dye or to the methine chain of the dye a terminal group of the formula

—NH—CO—CH=CH_2,

—CH_2O—CO—NH—CO—CH=CH_2,

—CH_2—NH—CO—NH—CO—CH=CH_2,

—NH—CO—CH_2—CH_2—SO_2—CH=CH_2

—NH—CH_2—CH_2—SO_2—CH=CH_2

—NH—CO—CCl=CH_2

—NH CO—CBr=CH_2

which is reactive with a hydrophilic colloid which contains an SH—, NH_2—, NH=, OH—, —CONL$_1$ L$_2$ group, where L$_1$ and L$_2$ are each hydrogen, lower alkyl or —COOH.

4,138,552

4-(V-TRIAZOLYL)-STYRYL OPTICAL BRIGHTENERS

Hans Schläpfer-Illi, deceased, late of Basel, Switzerland (by Nelly Schläpfer-Illi, Legal Representative, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

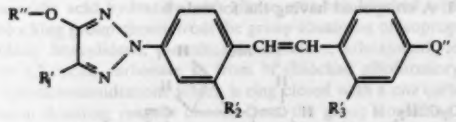
Filed Mar. 16, 1977, Ser. No. 777,981

Claims priority, application Switzerland, Mar. 26, 1976, 3815/76

Int. Cl.[2] C09K *11/06*; C07D *249/06*

U.S. Cl. 542—462 **7 Claims**

1. 4-(v-Triazolyl)-styryl compounds of the formula



wherein

R″ represents alkyl of 1 to 12 carbon atoms which is unsubstituted or substituted by alkoxy, hydroxyl, carboxyl, carbalkoxy or cyano, alkenyl of 3 to 5 carbon atoms or unsubstituted or substituted benzyl,

R_1' represents hydrogen, chlorine, bromine, or the group $—CH_2—Z$, wherein Z represents hydroxyl, benzyloxy, benzyloxy which is substituted by alkyl or alkoxy of 1 to 4 carbon atoms or by halogen, alkanoyloxy of 1 to 4 carbon atoms, alkoxy or alkylmercapto of 1 to 4 carbon atoms, a dialkylamino group containing 1 to 4 carbon atoms in each alkyl moiety, morpholino, piperidino, methyl-substituted morpholino or piperidino, or dialkylphosphono which contains 1 to 4 carbon atoms in each alkyl moiety, each of

R_2' and R_3' independently represents hydrogen, chlorine or cyano, and

Q″ represents a benzoxazol-2-yl, 2-aryl-1,3,4-oxdiazol-5-yl or 3(5)-aryl-1,2,4-oxdiazol-5(3)-yl group which is unsubstituted or substituted by non-chromophoric groups.

4,138,553

3-METHYLENE CEPHALOSPORANIC ACID DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

Sachio Ishimoto, Tokyo; Hisao Yamaguchi, Hino; Yoshinori Kato, Hino; Takeo Oba, Hino; Kenji Ozawa, Hino; Yataro Ichikawa, Fuchu; Koji Nakagawa, Iwakuni, and Hideki Tsuruta, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

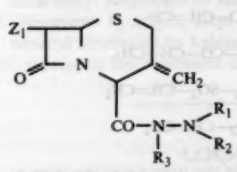
Division of Ser. No. 741,021, Nov. 11, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 841,321

Int. Cl.[2] C07D *501/02*

U.S. Cl. 544—18 **13 Claims**

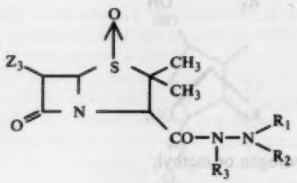
1. A process for preparing a compound of the formula

(I)



wherein R_1 represents alkyl containing 3 to 8 carbon atoms, cycloalkyl containing 5 to 8 carbon atoms, phenyl or phenyl substituted by alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms, and one of R_2 and R_3 represents hydrogen and the other represents hydrogen, alkyl containing 3 to 8 carbon atoms, cycloalkyl containing 5 to 8 carbon atoms, phenyl or phenyl substituted by alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms; R_1 and R_2 form, together with the nitrogen atom to which they are attached, a 5- or 6-membered heterocyclic ring which may contain one oxygen atom as a further hetero atom, and R_3 represents hydrogen, and Z_1 represents amino or amino protected by an amino-protecting group which can be removed without cleaving the β-lactam moiety of the cepham ring, or an acid addition salt of said compound, which comprises heating a compound of the formula

(II)



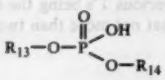
wherein R_1, R_2 and R_3 are the same as defined above, and Z_1 is amino protected by an amino-protecting group which can be removed without cleaving the β-lactam moiety of the penam ring, to a temperature of at least 50° C in the presence of a rearrangement promoter selected from the group consisting of

(a) an organic sulfonic acid of the formula

$$R_{12}(SO_3H)_n$$

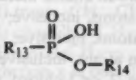
wherein R_{12} represents a hydrocarbon residue containing 1 to 15 carbon atoms and having a valence of n, which may contain at least one hetero atom selected from nitrogen, oxygen, sulfur and halogen, and n is an integer of 1 to 3,

(b) a mono- or di-ester of phosphoric acid of the formula



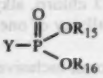
wherein R_{13} represents a monovalent hydrocarbon residue containing 1 to 12 carbon atoms and optionally containing at least one hetero atom selected from nitrogen, oxygen, sulfur and halogen, and R_{14} represents hydrogen or a monovalent hydrocarbon residue containing 1 to 12 carbon atoms and optionally containing at least one hetero atom selected from nitrogen, oxygen, sulfur and halogen,

(c) an organic phosphonic acid or monoester thereof of the formula



wherein R_{13} and R_{14} are the same as defined above, and

(d) a diester of a phosphoryl cyanide or azide of the formula



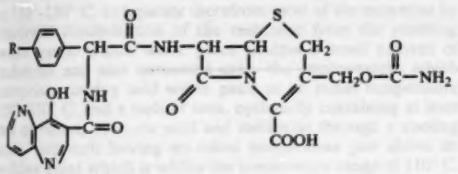
wherein R_{15} and R_{16}, independently of each other, represent alkyl containing 1 to 5 carbon atoms, aryl containing 6 to 10 carbon atoms or aralkyl containing 7 to 12 carbon atoms, and Y is —CN or $—N_3$, and, if desired, subjecting the resulting product to a reaction of eliminating the amino-protecting group, and, if desired, subjecting the reaction product to an acid addition salt-forming reaction.

4,138,554
7-[D-α-(4-HYDROXY-1,5-NAPHTHYRIDINE-3-CARBOXAMIDO)-α-PHENYL (AND P-HYDROXYPHENYL)ACETAMIDO]-3-CARBAMOYLOXYMETHYL-3-CEPHEM-4-CARBOXYLIC ACIDS

Takayuki Naito, Kawasaki; Jun Okumura, and Masahisa Oka, both of Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 784,870, Apr. 5, 1977, abandoned. This application Jun. 9, 1977, Ser. No. 804,963
Int. Cl.[2] C07D *501/34*
U.S. Cl. 544—22 45 Claims

1. An acid having the D configuration in the 7-sidechain and the formula



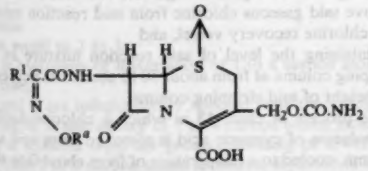
wherein R is hydrogen or hydroxy or a nontoxic, pharmaceutically acceptable salt of said acid or the pivaloyloxymethyl, acetoxymethyl, acetonyl, phenacyl, methoxymethyl, 3-phthalidyl, 5-indanyl, p-nitrobenzyl, β,β,β-trichloromethyl or benzhydryl ester of said acid.

4,138,555
(6R,7R)-7-[2-ARYL-2-(ETHERIFIED OXIMINO)ACETAMIDO]-3-CARBAMOYLOXYMETHYL-CEPH-3-EM-4-CARBOXYLIC ACID 1-OXIDES

Martin C. Cook, Liverpool; Gordon I. Gregory, Chalfont St. Peter, and Janice Bradshaw, Harrow, all of England, assignors to Glaxo Laboratories, Limited, Greenford, England

Continuation of Ser. No. 685,628, May 12, 1976, abandoned, which is a division of Ser. No. 497,113, Aug. 13, 1974, Pat. No. 3,974,153, which is a continuation-in-part of Ser. No. 413,970, Nov. 8, 1973, Pat. No. 3,966,717, which is a continuation-in-part of Ser. No. 304,524, Nov. 7, 1972, Pat. No. 3,971,778, which is a continuation-in-part of Ser. No. 252,666, May 12, 1972, abandoned. This application Nov. 18, 1977, Ser. No. 852,808
Claims priority, application United Kingdom, May 14, 1971, 15082/71; Oct. 1, 1971, 45884/71; May 12, 1972, 45884/72
Int. Cl.[2] C07D *501/20*
U.S. Cl. 544—22 3 Claims

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula



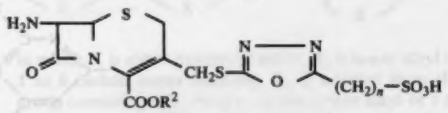
wherein R^1 is furyl, thienyl, or phenyl; and R^a is C_{1-4} alkyl, C_{3-7} cycloalkyl or phenyl; and a physiologically acceptable salt thereof.

4,138,556
7-AMINO-3-(SULFOALKYL SUBSTITUTED OXADIAZOLYLTHIOMETHYL) CEPHALOSPORINS

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 666,095, Mar. 11, 1976, Pat. No. 4,041,162. This application Apr. 25, 1977, Ser. No. 790,717
Int. Cl.[2] C07D *501/18*
U.S. Cl. 544—26 4 Claims

1. A compound of the formula:



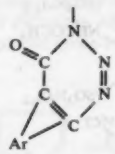
in which:
n is one to five; and
R^2 is hydrogen or a protecting ester group.

4,138,557
2-EQUIVALENT YELLOW COUPLERS

Immo Boie; Günter Renner, both of Cologne, and Friedrich-Wilhelm Kunitz, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 604,312, Aug. 13, 1975, which is a continuation-in-part of Ser. No. 532,904, Dec. 16, 1974, abandoned. This application Mar. 14, 1977, Ser. No. 777,168
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1973, 2363675
Int. Cl.[2] C07C *103/20, 97/16, 103/74;* C07D *253/08*
U.S. Cl. 544—183 2 Claims

1. In a 2-equivalent benzoyl acetanilide yellow coupler in which one hydrogen of the active methylene in the benzoyl acetanilide structure is substituted by the nitrogen of a heterocyclic group that is photographically relatively inert except that it is replaced by the oxidation product of a photographic developer to produce a yellow dye, the improvement according to which the heterocyclic group is



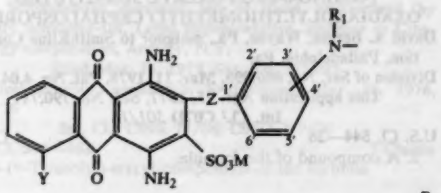
where Ar is a carbocyclic aromatic ring fused to the two carbons to which it is shown connected.

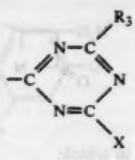
4,138,558
ANTHRAQUINONE COMPOUNDS

Ryuzo Orita, Yono, and Mitsuru Kurosawa, Urawa, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

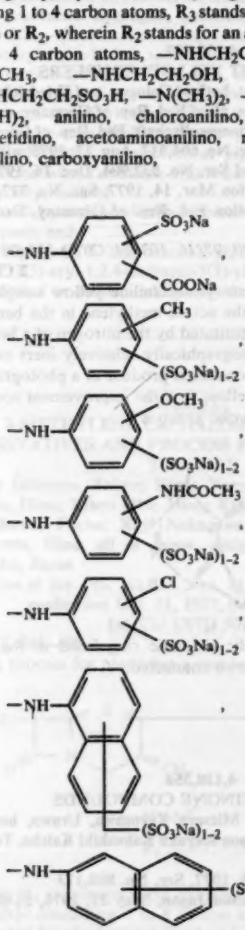
Filed May 25, 1977, Ser. No. 800,173
Claims priority, application Japan, May 27, 1976, 51-60621; Sep. 27, 1976, 51-114671
Int. Cl.[2] C07D *251/50, 251/44*
U.S. Cl. 544—189 16 Claims

1. An anthraquinone compound represented by the formula:

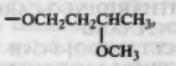




wherein Y stands for a hydrogen atom or nitro group, Z stands for an oxygen or sulfur atom when Y stands for a hydrogen atom, but Z stands for an oxygen atom when Y stands for a nitro group, R_1 stands for a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, R_3 stands for a chlorine or bromine atom or R_2, wherein R_2 stands for an amino, alkylamino having 1 to 4 carbon atoms, $-NHCH_2COOH$, $-NHCH_2CH_2CH_2OCH_3$, $-NHCH_2CH_2OH$, $-NHCH_2CH_2OSO_3H$, $-NHCH_2CH_2SO_3H$, $-N(CH_3)_2$, $-N(C_2H_5)_2$, $-N(CH_2CH_2OH)_2$, anilino, chloroanilino, toluidino, anisidino, phenetidino, acetoaminoanilino, monosulfoanilino, disulfoanilino, carboxyanilino,



, alkoxy having 1 to 4 carbon atoms, $-OCH_2CH_2OCH_3$, $-OCH_2CH_2OCH_2CH_2OCH_3$, $-OC_2H_4OC_2H_5$, $-OCH_2CH_2OCH_2CH_2CH_2CH_3$,



phenoxy, chlorophenoxy, methylphenoxy, methoxyphenoxy, nitrophenoxy, sulfophenoxy, carboxyphenoxy, methylthio, ethylthio, butylthio, $-SC_2H_4OH$, phenylthio, methylphenylthio, methoxyphenylthio,

N-methylanilino, 2-, 3- or 4- sulfo -N-methylanilino, X stands for a chlorine or bromine atom, M stands for a hydrogen, sodium or potassium atom.

4,138,559

RECOVERY OF CHLORINE AND CYANURIC ACID VALUES FROM POLYCHLOROISOCYANURIC ACIDS AND SALTS THEREOF

Michael C. Fullington, and Louis C. Hirdler, both of Lake Charles, La., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 30, 1978, Ser. No. 873,462
Int. Cl.[2] C07D *251/32;* C01B *7/07*
U.S. Cl. 544—192 **22 Claims**

1. In a process for recovering chlorine values from an aqueous solution of a chloroisocyanuric acid compound selected from the group consisting of polychloroisocyanuric acids, alkali metal salts of polychloroisocyanuric acid and mixtures thereof by reacting a mineral acid with said aqueous solution of said chloroisocyanuric acid compound to produce a reaction mixture containing dissolved chlorine and cyanuric acid in an aqueous solution, feeding said aqueous solution to a stripping column and removing said chlorine from said reaction mixture with an inert gas, and recovering said gaseous chlorine, the improvement which comprises maintaining a continuous liquid phase and a non-continuous gas phase in said stripping column.

18. A process for recovering chlorine values from an aqueous solution of a chloroisocyanuric acid compound selected from the group consisting of polychloroisocyanuric acids, alkali metal salts of polychloroisocyanuric acids, and mixtures thereof, which comprises:

(a) heating said aqueous solution,

(b) acidifying said aqueous solution with a mineral acid to form a reaction mixture comprising gaseous chlorine and cyanuric acid,

(c) feeding said reaction mixture to a stripping column,

(d) heating a gas inert to said reaction mixture,

(e) passing said inert gas through said reaction mixture to remove said gaseous chlorine from said reaction mixture to a chlorine recovery vessel, and

(f) maintaining the level of said reaction mixture in said stripping column at from about 70 to about 100 percent of the height of said stripping column.

19. The process of claim **18** in which a chlorine-depleted aqueous solution of cyanuric acid is removed from said stripping column, cooled to a temperature of from about 0 to about 35° C., and treated with an alkaline compound selected from the group consisting of alkali metal hydroxides and alkali metal carbonates to provide said solution with a pH of from about 4 to about 11.

4,138,560
PROCESS FOR COOLING MELAMINE SYNTHESIS WASTE GASES

Engelbert Hillenbrand, Heppenheim; Hermann D. Fromm, Gruenstadt, and Alfred Widmann, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 688,762, May 21, 1976, abandoned.
This application Dec. 27, 1977, Ser. No. 864,323
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1975, 2525781
Int. Cl.[2] C07D *251/60, 251/62*
U.S. Cl. 544—203 7 Claims

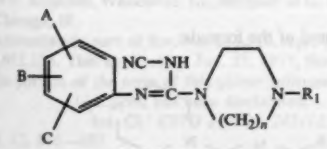
1. In a process for the synthesis of melamine by the catalytic conversion of urea at elevated temperatures in the presence of ammonia, thereby producing a synthesis gas containing unreacted urea and melamine vapors, and cooling said synthesis gas to 150°-250° C. to separate therefrom most of the melamine by fractional condensation of the melamine from the resulting waste gases, which waste gases contain a small amount of melamine and also unreacted urea, the improvement which comprises passing said waste gases at an initial temperature 150°-250° C. and a melt of urea, optionally containing at least one of biuret, cyanuric acid and melamine through a cooling zone, said melt having an initial temperature just above its melting point which is within the temperature range of 110° C. to 132.7° C., with direct contact between said waste gases and said melt, the temperature of said waste gases thereby being lowered in said zone to substantially the temperature of said melt, said cooling zone containing indirect heat exchange cooling surfaces contacted by said melt and said waste gases as they pass through said cooling zone, employing a cooling medium to cool said indirect heat exchange surfaces, said cooling medium having a temperature which is at least 3° C. below the solidification point of said melt, and removing heat from said cooling zone by said cooling surfaces at such a rate that the temperature of said melt in said cooling zone does not fall below its solidification point while avoiding substantial increases in temperature of said melt in said cooling zone, and withdrawing from said cooling zone the melt which has passed therethrough and in which the urea and the melamine in said waste gases has been absorbed.

4,138,561
CYANOCARBOXAMIDINES AND QUINAZOLINE PROCESS

Ronnie R. Crenshaw, Dewitt; George M. Luke, Lafayette, and Richard A. Partyka, Liverpool, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Sep. 30, 1977, Ser. No. 838,417
Int. Cl.[2] C07D *239/95*
U.S. Cl. 544—284 20 Claims

1. A compound selected from the group consisting of cyanocarboxamidines having formula II



(II)

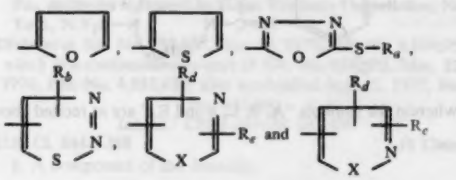
wherein

n is equal to 2 to 3,

A is hydrogen or lower alkyl of 1 to 4 carbon atoms inclusive;

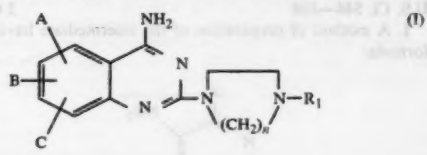
B and C are independently selected from the group consisting of lower alkoxy of 1 to 4 carbon atoms inclusive,

R_1 is selected from the group consisting of lower alkyl of from 1 to 6 carbon atoms inclusive, $R_2C{=}O$ in which R_2 is cycloalkenyl, cycloalkyl, methylcycloalkyl in which cycloalkyl and cycloalkenyl are from 3 to 8 carbon atoms inclusive, hydroxyalkoxy of from 2 to 6 carbon atoms inclusive or phenyl, and ZC═O in which Z is a heterocyclic radical selected from the group consisting of



in which X is either oxygen or sulfur, R_a is lower alkyl of 1 to 6 carbon atoms inclusive, R_b is selected from the group consisting of hydrogen, amino, lower alkyl of 1 to 4 carbon atoms inclusive and $NHCO_2R_c$ in which R_c is lower alkyl of 1 to 4 carbon atoms inclusive, R_d and R_e are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 6 carbon atoms inclusive, lower alkoxy of 1 to 6 carbon atoms inclusive, and lower alkylthio of 1 to 6 carbon atoms inclusive.

5. A process for preparing a quinazoline compound of formula I



(I)

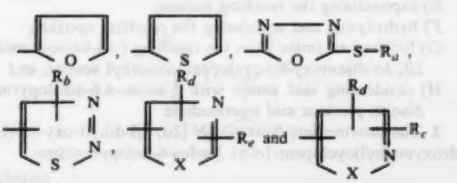
wherein

n is equal to 2 or 3;

A is hydrogen or lower alkoxy of 1 to 4 carbon atoms inclusive;

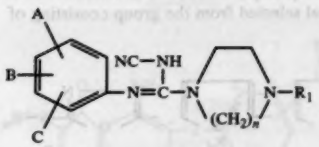
B and C are independently selected from the group consisting of lower alkoxy of 1 to 4 carbon atoms inclusive;

R_1 is selected from the group consisting of lower alkyl of from 1 to 6 carbon atoms inclusive; R_2CO in which R_2 is cycloalkenyl, cycloalkyl, methylcycloalkyl in which cycloalkyl and cycloalkenyl are from 3 to 8 carbon atoms inclusive; hydroxyalkoxy from 2 to 6 carbon atoms inclusive or phenyl; and ZC═O in which Z is a heterocyclic radical selected from the group consisting of



in which X is either oxygen or sulfur, R_a is lower alkyl of 1 to 6 carbon atoms inclusive, R_b is selected from the group consisting of hydrogen, amino, lower alkyl of 1 to 4 carbon atoms inclusive and $NHCO_2R_c$ in which R_c is lower alkyl of 1 to 4 carbon atoms inclusive, R_d and R_e are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 6 carbon atoms inclusive, lower alkoxy of 1 to 6 carbon atoms inclusive, and lower alkylthio of 1 to 6 carbon atoms inclusive

which comprises cyclizing a cyanocarboxamidine of formula II



(II)

wherein the symbols "A, B, C, *n* and R_1" are as recited above.

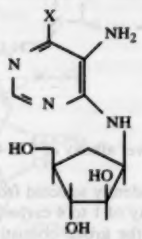
4,138,562

ADENOSINE DEAMINASE RESISTANT ANTIVIRAL PURINE NUCLEOSIDES AND METHOD OF PREPARATION

Robert Vince, St. Paul, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Feb. 9, 1977, Ser. No. 766,947
Int. Cl.² C07D *239/42, 473/30, 473/34, 473/38*
U.S. Cl. 544—326 **2 Claims**

1. A method of preparation of the intermediate having the formula:



wherein X is halogen, which method comprises:

A) hydrolysing 2 -azabicyclo [2.2.1]**hept** -5en-3-one under acid conditions,

B) esterifying the carboxyl function of the resulting cis-4 -aminocyclo-pent-2-ene carboxylic acid salt,

C) acetylating the amino group of the resulting ester,

D) reducing and acetylating said ester,

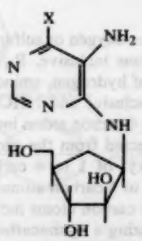
E) expoxidizing the resulting acetate,

F) hydrolysing and acetylating the resulting epoxide,

G) forming an amine from the resulting (+)-4α-acetamido-2β, 3α-diacetoxy-1α-cyclopentanemethyl acetate, and

H) condensing said amine with 5-amino-4,6-dihalopyrimidine to produce said intermediate.

2. The intermediate 5-amino-4N-[2α, 3β-dihydroxy-4α-(hydroxymethyl)cyclopent-1α-yl]**amino**-6-halopyrimidine:



wherein X is halogen.

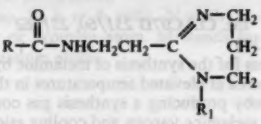
4,138,563

2-ACYLAMIDOETHYL-2-TETRAHYDROPYRIMIDINES

Hans P. Panzer, Stamford, and Kenny U. Acholonu, Bridgeport, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1978, Ser. No. 867,250
Int. Cl.² C07D *239/06*
U.S. Cl. 544—335 **5 Claims**

1. A compound of the structure



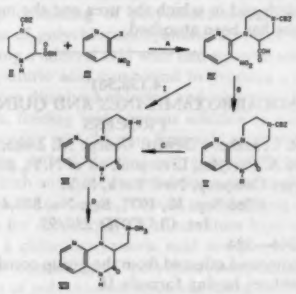
wherein R is an alkyl group of 1 to 5 carbon atoms and R_1 is hydrogen or an alkyl group of 1 to 5 carbon atoms.

4,138,564

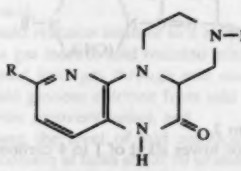
TETRAHYDRO[1H]PYRAZINO[1,2-a]AZAQUINOXALIN-5(6H)-ONES AND DERIVATIVES THEREOF

Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 3, 1977, Ser. No. 821,381
Int. Cl.² C07D *471/14*
U.S. Cl. 544—346 **6 Claims**



1. A compound of the formula:

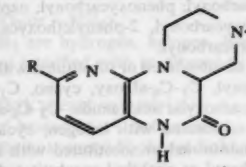


wherein:

R is hydrogen, chlorine, or fluorine; and

R^1 is hydrogen, methyl, ethyl, propyl, or isopropyl, or a non-toxic pharmaceutically acceptable acid addition salt thereof.

6. A compound of the formula:



wherein

Y^1 is carbobenzoxy, benzhydryl, benzyl, trifluoroacetyl, t-butyloxy carbonyl, or tosyl; and

R is hydrogen, chlorine, or fluorine.

4,138,565

STABLE SOLUTIONS AND PROCESSES FOR THEIR PREPARATION

Lothar Ehrhardt; Ludwig Patt, and Volker Hartmann, all of Nuremberg, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 689,969, May 26, 1976, abandoned. This application Sep. 15, 1977, Ser. No. 833,784

Claims priority, application Fed. Rep. of Germany, May 31, 1975, 2524184; Aug. 6, 1977, 2735587

Int. Cl.[2] C07D *519/02*

U.S. Cl. 544—346 **15 Claims**

1. A hydrogenated ergopeptide alkaloid solution which is stable against decomposition on storage consisting essentially of

(a) a hydrogenated ergopeptide alkaloid or a pharmacologically acceptable acid addition salt thereof, or a mixture thereof

(b) a pharmacologically acceptable alcohol or mixture thereof, and

(c) up to 40% by weight of the solution of water, and having a dielectric constant of 50 or less.

4,138,566

PIPERAZINYL CYCLOBUTENONES

Carl P. Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

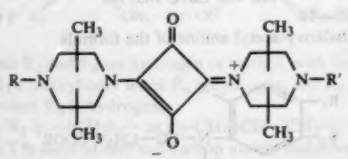
Continuation-in-part of Ser. No. 674,519, Apr. 7, 1976, Pat. No. 4,051,136. This application Jun. 27, 1977, Ser. No. 810,347

The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.

Int. Cl.[2] C07D *241/06, 241/12*

U.S. Cl. 544—357 **4 Claims**

1. A compound of the formula



wherein R and R′ are alkyl having from 2 to 6 carbon atoms.

4,138,567

N-CARBOBENZOXY-N′-(2-NITROPHENYL)-2-PIPERAZINE CARBOXYLIC ACID

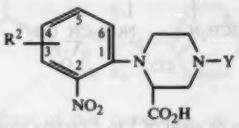
Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 752,577, Dec. 20, 1976, Pat. No. 4,089,958, which is a continuation-in-part of Ser. No. 668,872, Mar. 22, 1976, Pat. No. 4,032,639. This application Sep. 22, 1977, Ser. No. 835,560

Int. Cl.[2] C07D *241/18, 241/06*

U.S. Cl. 544—388 **11 Claims**

1. A compound of the formula:



wherein:

Y is carbobenzoxy; and

R^2 is hydrogen, (lower)alkyl, (lower)alkoxy, chlorine, fluorine, trifluoromethyl, or trifluoroacetamido in the 3-, 4-, or 5-position of the phenyl ring; or the salts thereof.

4,138,568

PROCESS FOR THE MANUFACTURE OF BENZIMIDAZOLONES-(2)

Stefan Hari, Allschwil; Ernesto Rinaldi, Reinach, and Josef Somlo, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

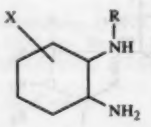
Filed May 31, 1977, Ser. No. 801,941

Claims priority, application Switzerland, Jun. 11, 1976, 7417/76

Int. Cl.[2] C07D *235/26*

U.S. Cl. 548—305 **6 Claims**

1. A process for the manufacture of nitrobenzimidazolones-(2) which comprises reacting an O-phenylenediamine of the formula



wherein

R represents a hydrogen atom, an alkyl group of 1 to 6 carbon atoms, phenyl or phenyl substituted by a chlorine atom, by a bromine atom, by an alkyl of 1 to 4 carbon atoms or by alkoxy of 1 to 4 carbon atoms, and

X represents a nitro group,

with urea, N-alkylurea with alkyl of 1 to 4 carbon atoms or N,N′-dialkylurea with alkyl of 1 to 4 carbon atoms in the ratio of 1 to 1.3 moles of urea or alkylated urea per mole of O-phenylenediamine in a halogenated benzene organic solvent, which has a solubility in water of not more than 5 g/l and has a boiling point above 100° C., at a temperature between 100° and 200° C.

4,138,569

5-SUBSTITUTED PHOSPHONATE HYDANTOINS AND DERIVATIVES THEREOF

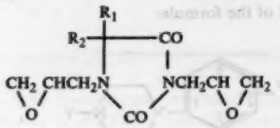
Luther A. R. Hall, Woodcliff Lake, N.J., and David A. Gordon, Scarsdale, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 698,623, Jun. 21, 1976, Pat. No. 4,093,809. This application Mar. 9, 1978, Ser. No. 885,060

Int. Cl.[2] C07D *405/06*

U.S. Cl. 548—309 **12 Claims**

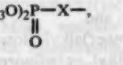
1. A compound of the formula



(II)

wherein

R_1 is hydrogen or alkyl of 1 to 8 carbon atoms, R_2 is



R_3 is alkyl of 1 to 8 carbon atoms, and

X is a straight or branched chain alkylene of 1 to 4 carbon atoms or a straight or branched chain alkylene of 3 to 6 carbon atoms containing an internal carbamido group, or

R_1 and R_2 together are Y where Y is a straight or branched chain alkylene of 4 to 8 carbon atoms having a pendant

moiety.

4,138,570

INDOLINE LINKED TO 2-PYRAZOLINE

Hubertus Psaar, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

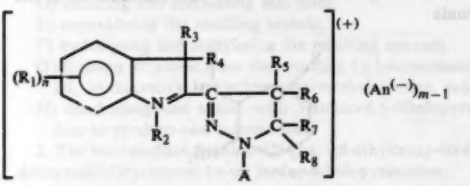
Filed May 5, 1976, Ser. No. 683,622

Claims priority, application Fed. Rep. of Germany, May 9, 1975, 2520816

Int. Cl.[2] C07D *403/04*

U.S. Cl. 548—379 **11 Claims**

1. Methine dyestuff of the formula



wherein

R_1 is halogen C_1–C_6-alkyl; C_1–C_6-alkyl substituted with carboxyl, hydroxyl, halogen, C_1–C_4-alkoxy, cyano, C_1–C_4-alkoxycarbonyl, or carboxylic acid amide; cyclopentyl or cyclohexyl unsubstituted or substituted with halogen or C_1–C_6-alkyl; benzyl, 2-phenylethyl or 2-phenylpropyl-(2) unsubstituted or substituted in the phenyl nucleus with halogen, cyano, nitro, C_1–C_4-alkoxy or C_1–C_6-alkyl; nitro; cyano; C_1–C_3-alkylcarbonyl; C_1–C_3-alkylsulphonyl; benzoyl; C_1–C_3-alkylcarbonylamino; C_1–C_3-alkylsulphonylamino, benzoylamino; amino; aminocarbonyl; aminosulphonyl; phenylsulphonyl; naphthylsulphonyl; C_1–C_4-alkoxy; phenoxy; napthoxy; benzyloxy; 2-phenylethoxy; 2-phenylpropoxy; carboxyl; C_1–C_4-alkoxycarbonyl; phenoxycarbonyl; naphthoxycarbonyl; benzyloxycarbonyl, 2-phenylethoxycarbonyl; or 2-phenylpropoxycarbonyl;

R_2 is C_1–C_6-alkyl unsubstituted or substituted with carboxyl, halogen, hydroxyl, C_1–C_4-alkoxy, cyano, C_1–C_4-alkoxycarbonyl, or carboxylic acid amide; C_2–C_6-alkenyl unsubstituted or substituted with halogen; cyclopentyl or cyclohexyl unsubstituted or substituted with halogen or C_1–C_4-alkyl; phenyl or naphthyl unsubstituted or substituted with halogen, carboxyl, cyano, nitro, C_1–C_6-alkyl or C_1–C_4-alkoxy; or benzyl, 2-phenylethyl or 2-phenylpropyl-(2) unsubstituted or substituted in the phenyl nucleus with halogen, cyano, nitro, C_1–C_4-alkoxy, or C_1–C_6-alkyl;

R_3 and R_4 are C_1–C_6-alkyl unsubstituted or substituted with carboxyl, halogen, hydroxyl, C_1–C_4-alkoxy, cyano, C_1–C_4-alkoxycarbonyl, or carboxylic acid amide; cyclopentyl or cyclohexyl unsubstituted or substituted with halogen or C_1–C_6-alkyl; or benzyl, 2-phenylethyl or 2-phenylpropyl-(2) unsubstituted or substituted in the phenyl nucleus with halogen, cyano, nitro, C_1–C_4-alkoxy or C_1–C_6-alkyl;

R_5, R_6, R_7 and R_8 are R_3 or R_4; or hydrogen, or phenyl or naphthyl unsubstituted or substituted with carboxyl, halogen, cyano, nitro, C_1–C_6-alkyl, or C_1–C_4-alkoxy; or R_6 and R_7 form a cyclohexane ring;

A is phenyl or naphthyl unsubstituted or substituted with halogen, cyano, nitro, C_1–C_6-alkyl, trifluoromethyl, phenyl, benzyl, C_1–C_4-alkoxy, phenoxy, benzyloxy, C_1–C_4-alkoxy-C_1–C_4-alkoxy, mono- or di-C_1–C_4-alkylamino, phenylamino, benzylamino, C_1–C_3-alkylcarbonylamino, formyl, C_1–C_3-alkylcarbonyl, benzoyl, carboxyl, C_1–C_4-alkoxycarbonyl, phenyloxycarbonyl, C_1–C_4-alkoxycarbonyl-methyl or -ethyl, aminocarbonyl, mono- or di-C_1–C_4-alkylaminocarbonyl, C_1–C_4-alkylsulphonyl, phenylsulphonyl, C_1–C_4-alkyl- or phenyloxysulphonyl, aminosulphonyl, mono- or di-C_1–C_4-alkylaminosulphonyl, C_1–C_4-alkoxycarbonylamino, C_1–C_4-alkylaminocarbonylamino, or sulpho;

n is 0, 1 or 2; and

m is 1 or 2, but is 1 only if A is substituted with sulpho.

4,138,571

NITROPHENYL IMINO PROPIONATES

David J. Tracy, Lincoln Park, N.J., and Walter F. Hoffstadt, Vestal, N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Nov. 15, 1976, Ser. No. 742,011

Int. Cl.[2] C07C *119/20*

U.S. Cl. 560—22 **2 Claims**

1. Ethyl β-ethoxy-β-(2-chloro-5-nitrophenylimino) propionate.

4,138,572

MALONANILIC DERIVATIVES

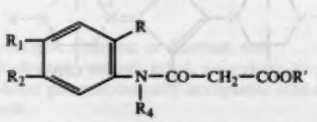
Silvano Rossi, Milan, Italy, assignor to Roussel UCLAF, Paris, France

Division of Ser. No. 276,242, Jul. 27, 1972, Pat. No. 4,001,408, which is a division of Ser. No. 41,757, Jun. 3, 1970, Pat. No. 3,984,398, which is a continuation of Ser. No. 689,810, Dec. 12, 1967, abandoned. This application Oct. 13, 1976, Ser. No. 731,988

Int. Cl.[2] C07C *103/147*

U.S. Cl. 560—43 **9 Claims**

1. N-carbalkoxy-acetyl aniline of the formula



wherein
R is $-NO_2$ or $-NH_2$
R_1 and R_2 are hydrogen, halogen, hydroxy, methoxy or carboxy esterified with an alkanol having 1 to 3 carbon atoms,
R_4 is methyl, phenyl or p-tolyl
R' is alkyl having 1 to 4 carbon atoms.
7. N-carbethoxyacetyl-N-phenyl-5-chloro-o-phenylene diamine.

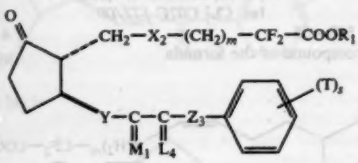
4,138,573

11-DEOXY-2,2-DIFLUORO-ω-ARYL-PGE COMPOUNDS

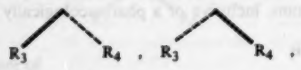
Gordon L. Bundy, Portage, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 609,410, Sep. 2, 1975. This application Apr. 17, 1978, Ser. No. 897,220
Int. Cl.² C07C *177/00*
U.S. Cl. 560—55 4 Claims

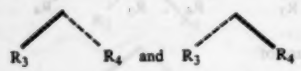
1. A compound of the formula



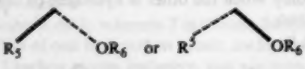
wherein Y is $-CH_2CH_2-$ or trans$-CH=CH_2-$;
wherein m is one to 3, inclusive;
wherein Z_3 is oxa or methylene;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, or alkyl of one to 3 carbon atoms, inclusive or a pharmacologically acceptable cation;
wherein L_4 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro and Z_3 is methylene;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that R_5 is methyl only when R_6 is hydrogen, and R_6 is methyl only when R_5 is hydrogen;
wherein X_2 is $-(CH_2)_3-$ or cis-$CH=CH-CH_2-$; and
wherein T is alkyl of one to 3 carbon atoms, inclusive, chloro, fluoro, trifluoromethyl, or $-OR_8$, wherein R_8 is alkyl of one to 3 carbon atoms, inclusive, amd s is zero to 3, inclusive, the various T's being the same or different.

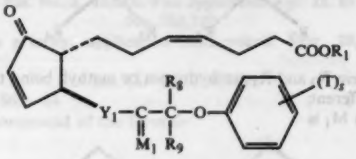
4,138,574

CIS-4,5-DIDEHYDRO-16-PHENOXY-PGA$_1$ COMPOUNDS

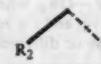
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 678,948, Apr. 21, 1976. This application Apr. 28, 1978, Ser. No. 900,821
Int. Cl.² C07C *177/00*
U.S. Cl. 560—53 7 Claims

1. An optically active compound of the formula:



or a racemic form of that compound and the enantiomer thereof;
wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,
wherein M_1 is



or

wherein R_2 is hydrogen, methyl, or ethyl,
wherein Y_1 is trans-CH=CH- or $-CH_2CH_2-$;
wherein R_8 and R_9 are hydrogen or methyl being the same or different; and
wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_3$, wherein R_3 is alkyl of one to 4 carbon atoms, inclusive; and wherein s is zero, one, 2, or 3 with the proviso that not more than two T's are other than alkyl;
including alkanoates of 2 to 8 carbon atoms, inclusive, and pharmacologically acceptable salts thereof when R_1 is hydrogen.

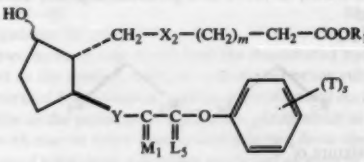
4,138,575

11-DEOXY-16-PHENOXY-PGF COMPOUNDS

Gordon L. Bundy, Portage, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

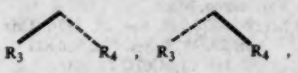
Division of Ser. No. 609,410, Sep. 2, 1975. This application Apr. 17, 1978, Ser. No. 897,217
Int. Cl.² C07C *177/00*
U.S. Cl. 560—55 4 Claims

1. A compound of the formula

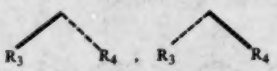


wherein Y is $-CH_2CH_2-$ or trans$-CH=CH-$;
wherein m is one to 3, inclusive;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, or alkyl of one to 3

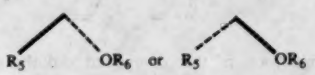
carbon atoms, inclusive or a pharmacologically acceptable cation;
wherein L_5 is



or a mixture of



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that R_5 is methyl only when R_6 is hydrogen, and R_6 is methyl only when R_5 is hydrogen;
wherein X_2 is $-(CH_2)_3-$ or cis-$CH=CH-CH_2-$; and
wherein T is alkyl of one to 3 carbon atoms, inclusive, chloro, fluoro, trifluoromethyl, or $-OR_8$, wherein R_8 is alkyl of one to 3 carbon atoms, inclusive, and s is zero to 3, inclusive, the various T's being the same or different.

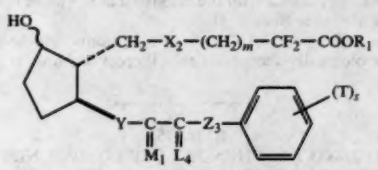
4,138,576

11-DEOXY-2,2-DIFLUORO-ω-ARYL-PGF COMPOUNDS

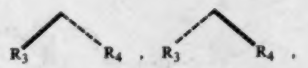
Gordon L. Bundy, Portage, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 609,410, Sep. 2, 1975. This application Apr. 17, 1978, Ser. No. 897,218
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—55 **4 Claims**

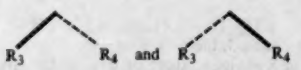
1. A compound of the formula



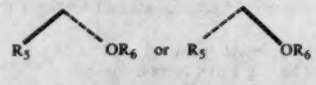
wherein Y is $-CH_2CH_2-$ or trans-$CH=CH-$;
wherein m is one to 3, inclusive;
wherein Z_3 is oxa or methylene;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, or alkyl of one to 3 carbon atoms, inclusive or a pharmacologically acceptable cation;
wherein L_4 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro and Z_3 is methylene;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that R_5 is methyl only when R_6 is hydrogen, and R_6 is methyl only when R_5 is hydrogen;
wherein X_2 is $-(CH_2)_3-$ or cis-$CH=CH-CH_2-$; and
wherein T is alkyl of one to 3 carbon atoms, inclusive, chloro, fluoro, trifluoromethyl, or $-OR_8$, wherein R_8 is alkyl of one to 3 carbon atoms, inclusive, and s is zero to 3, inclusive, the various T's being the same or different.

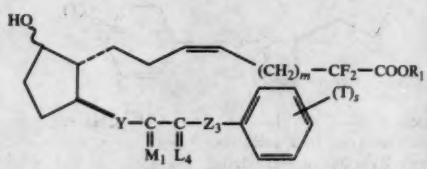
4,138,577

11-DEOXY-CIS-4,5-DIDEHYDRO-ω-ARYL-PGF COMPOUNDS

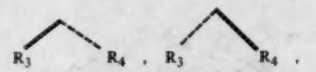
Gordon L. Bundy, Portage, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 609,410, Sep. 2, 1975. This application Apr. 17, 1978, Ser. No. 897,219
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—55 **4 Claims**

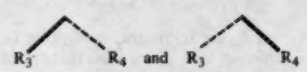
1. A compound of the formula



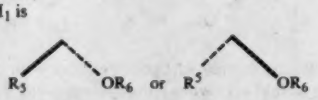
wherein Y is $-CH_2CH_2-$ or trans-$CH=CH-$;
wherein m is one to 3, inclusive;
wherein Z_3 is oxa or methylene
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, or alkyl of one to 3 carbon atoms, inclusive or a pharmacologically acceptable cation;
wherein L_4 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro and Z_3 is methylene;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that R_5 is methyl only when R_6 is hydrogen, and R_6 is methyl only when R_5 is hydrogen;
wherein T is alkyl of one to 3 carbon atoms, inclusive, chloro, fluoro, trifluoromethyl, or $-OR_8$, wherein R_8 is alkyl of one

to 3 carbon atoms, inclusive, and s is zero to 3, inclusive, the various T's being the same or different.

4,138,578

9-DEOXY-9-METHYLENE-16-PHENYL-17,18,19,20-TETRANOR-5,6,13,14-TETRADEHYDRO-4,4,5,5,13,14-HEXADEHYDRO-PGF$_1$ COMPOUNDS

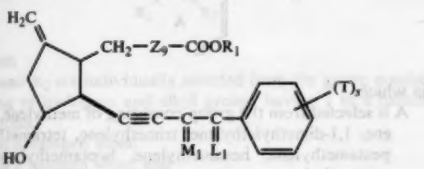
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 786,249, Apr. 11, 1977, Pat. No. 4,118,584. This application Jul. 12, 1978, Ser. No. 924,034

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 560—55 63 Claims

1. A prostaglandin analog of the formula

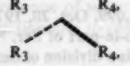


wherein M_1 is

or

wherein R_5 is hydrogen or methyl;

wherein L_1 is



or a mixture of

and

wherein R_3 and R_4 are hydrogen, mehtyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein Z_9 is $—C{\equiv}C—CH_2—(CH_2)_g—CH_2$ or $—CH_2—C{\equiv}C—(CH_2)_g—CH_2—$

wherein g is one, 2, or 3; wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

Wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation, and the 1,11- or 1,15-lactones thereof.

4,138,579

ALKYNYLOXY-PHENYL DERIVATIVES

Madhukar S. Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

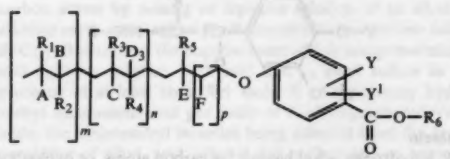
Division of Ser. No. 671,453, Mar. 29, 1976, Pat. No. 4,051,319, which is a division of Ser. No. 548,469, Feb. 10, 1975, Pat. No. 3,957,833, which is a division of Ser. No. 312,074, Dec. 4, 1972, Pat. No. 3,880,935, which is a division of Ser. No. 123,060, Mar. 10, 1971, Pat. No. 3,718,686. This application Apr. 25, 1977, Ser. No. 790,729

Claims priority, application Switzerland, Mar. 25, 1970, 4621/70

Int. Cl.^{2} C07C *69/92*

U.S. Cl. 560—64 6 Claims

1. A compound of the formula



wherein A, B, C, D, E, and F are individually hydrogen, or A and B taken together form a carbon to carbon bond, C and D taken together form a carbon to carbon bond, E and F taken together form a carbon to carbon bond; R_1, R_3 and R_5 are methyl or ethyl;

Y and Y^1 are hydrogen, halogen, lower alkyl or lower alkoxy; R_2 and R_4 are hydrogen or methyl; R_6 is lower alkynyl; and m, n and p are integers of from 0 to 1; with at least one of m, n and p being 1; with the proviso that A, B, C, D, E and F are not all hydrogen.

4,138,580

PROCESS FOR PREPARING DIESTERS OF DICARBOXYLIC ACIDS

Sumio Umemura; Kanenobu Matsui; Yoshinari Ikeda, and Katsuro Masunaga, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Sep. 29, 1977, Ser. No. 837,850

Claims priority, application Japan, Oct. 6, 1976, 51/119403; Jul. 19, 1977, 52/85565

Int. Cl.^{2} C07C *67/38*

U.S. Cl. 560—81 16 Claims

1. A process for preparing a diester of a dicarboxylic acid having two more carbon atoms than the unsaturated hydrocarbon used as the starting material, which comprises subjecting an unsaturated hydrocarbon, carbon monoxide and an alcohol to reaction in the presence of a platinum group metal in combination with one or more compounds selected from the group consisting of nitric acid, a nitrogen oxide and an ester of nitrous acid, the amount of said nitric acid being from 0.0001 to 10 moles per liter of the reaction medium, the amount of said nitrogen oxide being from 0.1 to 100 mole % of the amount of the unsaturated hydrocarbon, and the amount of said ester of nitrous acid being from 0.0001 to 10 moles per liter of the reaction medium.

4,138,581
3(HYDROXY OR HYDROXYMETHYL)-4(HYDROXY)-α-(AMINOMETHYL)BENZYL ALCOHOLS

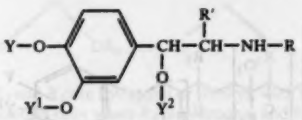
Hiroaki Minatoya, East Greenbush, N.Y.; Benjamin F. Tullar, Laurel Park, N.C., and Walter D. Conway, Amherst, N.Y., assignors to Sterling Drugs Inc., New York, N.Y.

Continuation-in-part of Ser. No. 496,538, Aug. 12, 1974, abandoned, which is a division of Ser. No. 123,834, Mar. 12, 1971, Pat. No. 3,904,671, which is a continuation-in-part of Ser. No. 812,370, Apr. 1, 1969, abandoned. This application Feb. 2, 1976, Ser. No. 654,700

Int. Cl.[2] C09F *5/08*

U.S. Cl. 560—109 46 Claims

1. An ester of 3,4-dihydroxy-alpha-(amino- and N-substituted amino-methyl)benzyl alcohol having the formula



wherein

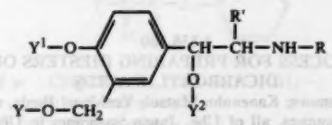
R is hydrogen, alkyl having 1-4 carbon atoms, or cycloalkyl having 3-6 carbon atoms;

R′ is hydrogen or ethyl;

Y is an acyl member which is alkanoyl having 1–22 carbon atoms, alkenoyl having one or two double bonds and having 4–22 carbon atoms, cycloalkyl—C_nH_{2n}—CO— having a total of 4–10 carbon atoms of which 3–7 are ring carbon atoms in cycloalkyl and wherein n is zero, one or two, 1- or 2-adamantanecarbonyl, phenoxyacetyl, naphthalenecarbonyl, or Z—C_nH_{2n}—CO— wherein n is zero, one or two and Z is phenyl or phenyl substituted by 1-3 members of the group consisting of alkyl having 1-4 carbon atoms, halo, or trifluoromethyl; and

Y^1 and Y^2 are the same or different and are hydrogen or one of the acyl members defined by Y, at least one of Y and Y^1 being Z—C_nH_{2n}—CO— or a pharmaceutically acceptable acid-addition salt thereof.

29. An ester of 3-hydroxymethyl-4-hydroxy-alpha-(amino- and N-substituted amino-methyl)benzyl alcohol having the formula



wherein

R is hydrogen, alkyl having 1–4 carbon atoms, or cycloalkyl having 3–6 carbon atoms;

R′ is hydrogen or alkyl having 1–3 carbon atoms;

Y is an acyl member which is alkanoyl having 1–22 carbon atoms, alkenoyl having one or two double bonds and having 4–22 carbon atoms, cycloalkyl—C_nH_{2n}—CO— having a total of 4–10 carbon atoms of which 3–7 are ring carbon atoms in cycloalkyl and wherein n is zero, one or two, 1- or 2-adamantanecarbonyl, phenoxyacetyl, naphthalenecarbonyl, or Z—C_nH_{2n}—CO— wherein n is zero, one or two and Z is phenyl or phenyl substituted by 1–3 members of the group consisting of alkyl having 1–4 carbon atoms, halo, or trifluoromethyl; and

Y^1 and Y^2 are the same or different and are hydrogen or one of the acyl members defined by Y,

at least one of Y and Y^1 being Z—C_nH_{2n}—CO— or a pharmaceutically acceptable acid-addition salt thereof.

4,138,582
CYCLOALKENYL ANALOGUES OF PROSTAGLANDIN A

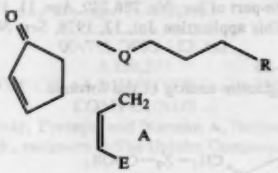
Warren D. Woessner; William G. Biddlecom; Henry C. Arndt, all of Madison; George P. Peruzzotti, Middleton, and Charles J. Sih, Madison, all of Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 624,099, Oct. 20, 1975, Pat. No. 4,066,834, which is a continuation-in-part of Ser. No. 436,222, Jan. 24, 1974, abandoned, which is a division of Ser. No. 383,670, Jul. 30, 1973, abandoned. This application Jun. 6, 1977, Ser. No. 803,612

Int. Cl.[2] C07L *177/00*

U.S. Cl. 560—118 7 Claims

1. A compound of the formula,



in which:

A is selected from the group consisting of methylene, ethylene, 1,1-dimethylethylene, trimethylene, tetramethylene, pentamethylene, hexamethylene, heptamethylene, and octamethylene;

E is selected from the group consisting of methylene, α-hydroxymethylene, and β-hydroxymethylene;

Q is selected from the group consisting of ethylene and vinylene; and

R is selected from the group consisting of carboxy, carbomethoxy, and carbethoxy.

4,138,583
CYCLOALKENYL ANALOGUES OF PROSTAGLANDIN F

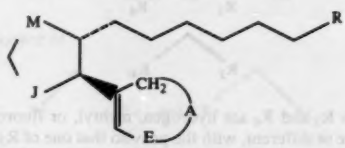
Warren D. Woessner; William G. Biddlecom; Henry C. Arndt, all of Madison; George P. Peruzzotti, Middleton, and Charles J. Sih, Madison, all of Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 624,099, Oct. 20, 1975, Pat. No. 4,066,834, which is a continuation-in-part of Ser. No. 436,222, Jan. 24, 1974, abandoned, which is a division of Ser. No. 383,670, Jul. 30, 1973, abandoned. This application Jun. 6, 1977, Ser. No. 803,611

Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—118 5 Claims

1. A compound having the formula,



in which:

A is selected from the group consisting of methylene, ethylene, 1,1,-dimethylethylene, trimethylene, tetramethylene, pentamethylene, hexamethylene, hepamethylene, and octamethylene;

E is selected from the group consisting of methylene, α-hydroxymethylene, and β-hydroxymethylene;

J is selected from the group consisting of α-hydroxymethylene and β-hydroxymethylene;

M is selected from the group consisting of α- hydoxymethylene and β-hydroxymethylene; and

R is selected from the group consisting of carboxyl, carbomethoxy, and carbethoxy.

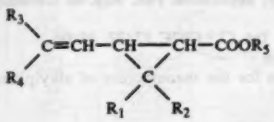
4,138,584

PRODUCTION OF CHRYSANTHEMIC ACID ESTERS AND HOMOLOGUES THEREOF

Per D. Klemmensen, Lemvig; Hans Kolind-Andersen, Harboor, and Hans B. Madsen, Lemvig, all of Denmark, assignors to A/S Cheminova, Lemvig, Denmark

Filed May 23, 1977, Ser. No. 799,587
Claims priority, application United Kingdom, May 25, 1976, 21630/76
Int. Cl.[2] C07C *67/30*
U.S. Cl. 560—124 5 Claims

1. A process for the preparation of chrysanthemic acid esters and their homologues of the formula:



I

wherein

R_1 and R_2 are individually selected from the group consisting of hydrogen and alkyl groups having 1 to 6 carbon atoms,

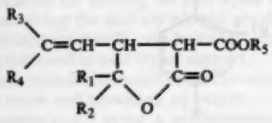
R_3 is a halogen atom;

R_4 is a halogen atom; and

R_5 is an alkyl group having 1 to 6 carbon atoms,

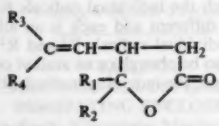
which comprises the steps of:

(1) heating a lactone of the formula:



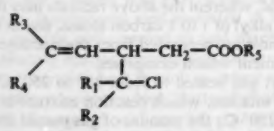
VIII

in which R_1, R_2, R_3, R_4 and R_5 have the above stated meanings, to a temperature of from about 100° C. to about 200° C. in the presence of water and an inert solvent to effect decarboxylation and to obtain a lactone of the formula:



IX

(2) reacting the lactone IX with thionyl chloride and with an aliphatic alcohol R_5OH, wherein R_5 has the above-stated meaning, at a superatmospheric pressure to bring about, in the same reaction mixture, ring cleavage, halogenation and esterification without isolating any intermediate product, whereby there is obtained an ester of the formula:



X

(3) treating the ester X with a base to effect dehydrohalogenation and internal condensation whereby the desired compound of formula I is obtained.

4,138,585

PROCESS FOR PREPARING N-ALKOXYCARBONYL-N-ALKYLCYANAMIDE

Charles D. Adams, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 1, 1978, Ser. No. 874,354
Int. Cl.[2] C07C *125/06*
U.S. Cl. 560—159 7 Claims

1. In a process for preparing N-ethoxycarbonyl-N-alkylcyanamides of the formula

wherein R is alkyl of 1-3 carbon atoms and R′ is alkyl of 1-3 carbon atoms by mixing an aqueous solution of an alkali or alkaline earth metal salt of N-alkoxycarbonylcyanamide with a di-C_{1-3} alkyl sulfate, the improvement which comprises mixing said aqueous solution with said di-C_{1-3} alkyl sulfate in the presence of at least about 0.1 mole % of quaternary hydrocarbyl ammonium ions per mole of N-alkoxycarbonylcyanamide, the hydrocarbyl moieties being selected from the group consisting of alkyl, aryl, alkaryl and aralkyl groups having a total carbon content of from 7 to 60 carbon atoms.

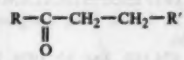
4,138,586

PROCESS FOR ALKANOYL PROPIONATES

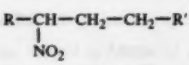
Alexander E. Wick, Riehen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 14, 1975, Ser. No. 622,289
Int. Cl.[2] C07C *67/30, 69/67*
U.S. Cl. 560—174 4 Claims

1. A process for the preparation of compounds of the formula



wherein R is lower alkyl and R′ is lower alkoxycarbonyl which process comprises treating a compound of the formula



wherein R and R′ are as above with an alkali metal hydroxide in an alkanol, ozonizing the product obtained at a temperature of about 0° C. and working up the ozonization product by reductive treatment with an agent selected from sodium hydrogen sulfite, sodium sulfite, dimethyl sulfide or zinc/glacial acetic acid or oxidative treatment with an agent selected from hydrogen peroxide/formic acid or silver oxide.

4,138,587

PROCESS FOR THE PREPARATION OF DIALKYL OXALATES

Toshiharu Yamasaki; Masao Eguchi; Schinichiro Uchiumi; Keigo Nishihira; Masayoshi Yamashita, all of Ube, and Hiroshi Itatani, Ichihara, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Jul. 22, 1977, Ser. No. 817,996
Claims priority, application Japan, Jul. 27, 1976, 51/88673
Int. Cl.[2] C07C *67/36, 69/36*
U.S. Cl. 560—204 12 Claims

1. A process for the preparation of dialkyl oxalates by reacting an alkanol having from 1 to 6 carbon atoms with carbon monoxide under pressure, which comprises carrying out the reaction in the presence of

(a) a catalytic amount of a catalyst comprising a platinum group metal or a salt thereof,
(b) an accelerating amount of an accelerator composed of one or more compounds selected from the group consisting of nitric acid and nitrogen oxides, and
(c) molecular oxygen.

4,138,588

PROCESS FOR THE IMPROVED MANUFACTURE OF 2-ETHYLHEXANOL

Hans Tummes; Heinz Noeske, both of Oberhausen; Boy Cornils, Dinslaken, and Waldemar Kascha, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,709

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713434

Int. Cl.[2] C07C *29/14*

U.S. Cl. 568—881 **4 Claims**

1. In a process for the manufacture of 2-ethylhexanol wherein n-butyraldehyde is subjected to aldol condensation, the resultant aldol condensation product is catalytically hydrogenated in a hydrogenation stage and the hydrogenation product is subjected to two separate multiple stage distillations to separate, in the first case the first runnings, a fraction containing the main amount of 2-ethylhexanol, and the residue, in the second case this residue is separated into a 2-ethylhexanol fraction and a distillation residue, the improvement which comprises cracking said distillation residue by heating the same at 200° to 250° C. whereby to obtain cracked products comprising n-butanal, 2-ethylhexenal, 2-ethylhexanal, and/or 2-ethylhexanol together with non-cracked higher boiling substances, separating said cracked products from said non-cracked products and recycling said cracked products to said hydrogenation stage.

4,138,589

SUBSTITUTED ISOPHTHALAMIC ACIDS

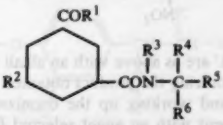
Philip E. Wiegert, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 676,169, Apr. 12, 1976, Pat. No. 4,069,250, which is a continuation of Ser. No. 479,716, Jun. 17, 1974, abandoned. This application Jul. 21, 1977, Ser. No. 817,900

Int. Cl.[2] C07C *101/54*

U.S. Cl. 562—434 **7 Claims**

1. A compound represented by the following formula



wherein R^1 is OH or OM, M being a pharmaceutically acceptable cation; R^2 is amino or nitro; R^3 is hydrogen; R^4 is methyl or hydroxymethyl and each R^5 and R^6 is hydroxymethyl.

4,138,590

PROSTAGLANDIN DERIVATIVES

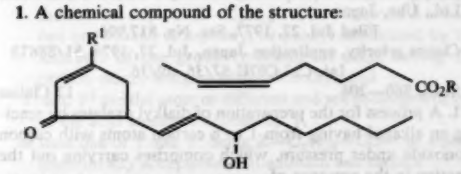
Wenling Kao, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 13, 1977, Ser. No. 759,315

Int. Cl.[2] C07C *177/00*

U.S. Cl. 562—503 **2 Claims**

1. A chemical compound of the structure:



wherein R is hydrogen, alkyl of from 1–6 carbon atoms, alkali metal, or a pharmacologically acceptable cation derived from ammonia or a basic amine; and R^1 is ethynyl.

4,138,591

MANUFACTURE OF ALKYLPHENOLS

Karl G. Baur, Ludwigshafen; Hans Hellbach, Frankenthal; Rolf Platz, Mannheim and Kurt Taglieber, Ludwigshafen, all of Fed Rep of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed Rep. of Gernamy

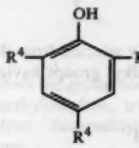
Filed Oct. 19, 1977, Ser. No. 843,512

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1976, 2650889

Int. Cl.[2] C07C *37/22, 39/06*

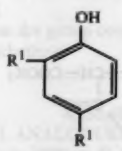
U.S. Cl. 568—756 **12 Claims**

1. In a process for the manufacture of alkylphenols of the formula



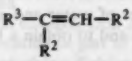
III,

in which an unsubstituted or substituted phenol of the formula



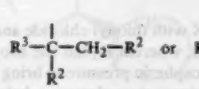
I

is reacted with an olefin of the formula



II

to form a reaction mixture containing alkylphenols and unreacted phenol in which the individual radicals R^1, R^2 and R^3 may be identical or different and each is an alkyl of 1 to 9 carbon atoms, the individual radicals R^1 and R^2 may also be hydrogen, R^3 may also be phenyl, or an aralkyl or alkylphenyl of 7 to 12 carbon atoms, the individual radicals R^4 and R^5 may each be



one radical R^4 and/or the radical R^5 may also each be hydrogen, or each radical R^4 has the same meaning as R^1 if the radical R^1, present as a substituent on the same carbon atom, is an aliphatic radical, wherein the above radicals may in addition be substituted by alkyl of 1 to 3 carbon atoms, and in which the formed alkylphenols are separated from the unconverted phenol, the improvement which comprises:

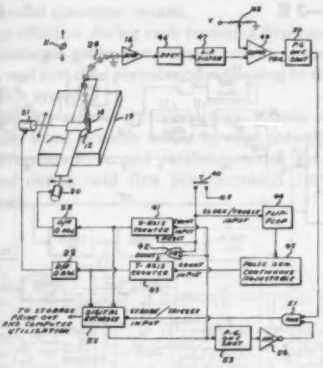
passing an inert gas heated to from 80° to 250° C. through the reaction mixture, which reaction mixture is heated to from 80° to 250° C., the amount of gas passed through the mixture being from 0.3 to 6 parts by volume per hour per part by weight of starting phenol; cooling the thus laden gas to from −40° to +100° C.; and isolating the phenol-containing mixture which separates out on cooling the gas.

4,138,592

ELECTROMAGNETIC DETECTION LINE DIGITIZER

Jack D. Capehart, 5562 Overbrooke Rd., Kettering, Ohio 45440; John F. Mazzae, 803 Picket Pl., Dayton, Ohio 45433, and David R. McGrew, 7543 Abraham Ct., Dayton, Ohio 45414

Filed Sep. 16, 1977, Ser. No. 833,778
Int. Cl.[2] G08B 5/22
U.S. Cl. 178—19 2 Claims



1. A graphic curve digitizer for converting data from the form of an x-y plotted conductive graphical curve to digital data in x-y coordinate form; the said conductive graphic curve being located in a normal ambient alternating current electromagnetic field and thereby having an induced voltage, the said digitizer comprising:

a. an x-y plotter having a stylus support and x-y transport mechanism for moving the said stylus support and means for receiving the said x-y plotted graphical curve;

b. a shielded electrically conductive stylus having a sensitive tip positioned in said stylus support;

c. a high impedance amplifier electrically connected to the said stylus and providing an output;

d. a comparator having a predetermined reference level electrically connected to said high impedance input amplifier and providing an output when the said output from the high impedance amplifier exceeds the said reference level; and

e. means cooperating with the said output of the comparator and the said stylus transport mechanism for advancing the said transport mechanism in x and y increments responsive to the said stylus contacting the said conductive graphical curve and providing a digitized record of the said curve.

4,138,593

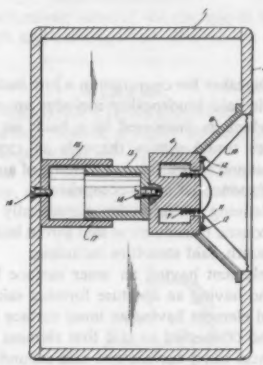
MOVING VOICE COIL LOUDSPEAKER WITH HEAT DISSIPATING ENCLOSURE

Wolfgang Hasselbach, Königstein; Manfred Leyerzapf, Frankfurt am Main; Klaus Dotter, Frankfurt-Bonames; Karleugen Habfast, Schwalbach, and Karl Müller, Frankfurt am Main-Nied, all of Fed. Rep. of Germany, assignors to Braun AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 771,798
Int. Cl.[2] H04R 1/02
U.S. Cl. 179—1 E 3 Claims

1. In a dynamic loudspeaker of the type comprised of a housing part and a sound wall part, a diaphragm mounted in the speaker, a moving-coil unit mounted in the speaker and including a moving coil coupled to said diaphragm for transmitting oscillatory motion thereto, said moving-coil unit when in operation generating heat to such an extent as to tend to limit the rated steady power at which the loudspeaker can be operated without damage to said moving-coil unit, the improvement wherein at least one of said parts is comprised of at least one portion made of a material having a thermal conductivity W equal to or greater than 40 kcal/m-h-° C., and further including a heat-transmitting structure comprised of a material likewise having a thermal conductivity W equal to or greater than 40 kcal/m-h-° C., said heat-transmitting structure extending from said moving-coil unit to said at least one portion and being in thermally conductive engagement with both said moving-coil unit and said at least one portion, said housing part including said at least one portion, said moving-coil unit including a permanent magnet structure, said moving coil of said unit being mounted on said permanent magnet structure, said heat-transmitting structure comprising a bent S-shaped sheet-metal strip comprised of said material and having two ends, one of said ends being connected to said permanent magnet structure in thermally conductive engagement therewith, the other of said ends being connected to said at least one portion of said housing part in thermally conductive engagement therewith.

2. In a dynamic loudspeaker of the type comprised of a housing part and a sound wall part, a diaphragm mounted in the speaker, a moving-coil unit mounted in the speaker and including a moving coil coupled to said diaphragm for transmitting oscillatory motion thereto, said moving-coil unit when in operation generating heat to such an extent as to tend to limit the rated steady power at which the loudspeaker can be operated without damage to said moving-coil unit, the improvement wherein at least one of said parts is comprised of at least one portion made of a material having a thermal conductivity W equal to or greater than 40 kcal/m-h-° C., and further including a heat-transmitting structure comprised of a material likewise having a thermal conductivity W equal to or greater than 40 kcal/m-h-° C., said heat-transmitting structure extending from said moving-coil unit to said at least one portion and being in thermally conductive engagement with both said moving-coil unit and said at least one portion, said moving-coil unit including a permanent magnet structure, said moving coil of said unit being mounted on said permanent magnet structure, said heat-transmitting structure comprising first and second components each comprised of said material, said first component being connected to said permanent magnet structure in thermally conductive engagement therewith, said second component being connected to said at least one portion in thermally conductive engagement therewith, one of said components being received within the other of said components, said first component being guided by said second component for movement relative to said first component in a predetermined direction so as to permit limited movement of said permanent magnet structure, said first and second components being in thermally conductive engagement with each other.

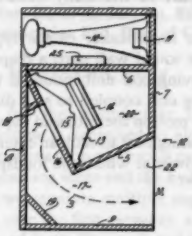


4,138,594

SMALL DIMENSION LOW FREQUENCY FOLDED EXPONENTIAL HORN LOUDSPEAKER WITH UNITARY SOUND PATH AND LOUDSPEAKER SYSTEM INCLUDING SAME

Paul W. Klipsch, Hope, Ark., assignor to Klipsch and Associates, Inc., Hope, Ark.

Filed Jun. 2, 1977, Ser. No. 802,734
Int. Cl.[2] H04R 1/30
U.S. Cl. 179—1 E **11 Claims**



1. In a loudspeaker for operation in a low audible frequency range, wherein said loudspeaker includes an electroacoustic transducer, which is immersed in a back air chamber and which radiates sound waves through an exponential horn having a throat and a mouth into a volume of air, the improvement in said exponential horn, comprising:

structure defining a region for acoustically coupling said electroacoustic transducer at said throat to a volume of air at said mouth, said structure including:

(a) a first element having an inner surface bordering said region and having an aperture forming said throat;

(b) a second element having an inner surface bordering said region and connected to said first element such that said first element inner surface and said second element inner surface form an angle greater than 180°;

(c) a third element having an inner surface bordering said region and connected to said first element near said throat;

(d) a fourth element having an inner surface bordering said region and connected to said third element such that said third element inner surface and said fourth element inner surface form an angle less than 180°;

said first and second elements being oriented with respect to said third and fourth elements such that the distance therebetween increases at an exponential rate from said throat; and

said wall means having an inner surface and connected to said elements for enclosing said region from said throat to said mouth;

said region being curved to minimize the size of said loudspeaker and to provide a length such that, at an exponential rate of expansion between said throat and said mouth, said mouth, when located proximate at least one boundary surface, has adequate area for high fidelity sound reproduction to below a preselected low end cut-off frequency;

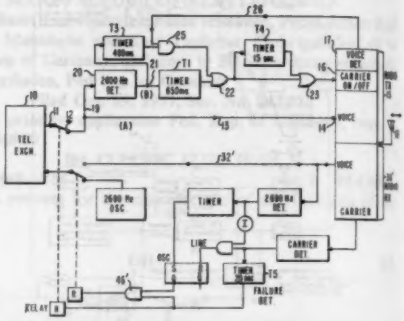
said preselected low end cut-off frequency having a wavelength λ, and said throat having an equivalent circle diameter of approximately λ/20, said mouth having an equivalent circle diameter of approximately λ/12, said region having a mean length of approximately λ/10, and said rate of expansion being such that the cross-sectional area of said region doubles approximately every λ/18.

4,138,595

IDLE-BUSY SIGNALLING BETWEEN TELEPHONE SYSTEM AND RADIOPHONE SYSTEM

John R. Barkwith, Hauppauge, N.Y., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,856
Claims priority, application Canada, Aug. 23, 1977, 285341
Int. Cl.[2] H04M 7/00, 3/22; H04B 1/38
U.S. Cl. 179—2 E **8 Claims**



1. An interface unit for use between a telephone system in which a single-frequency (SF) tone is transmitted in both directions when the circuit is on-hook (idle) and a single-channel-per-carrier radio system in which the radio frequency (RF) carrier is not transmitted when the circuit is idle, comprising

a transmitting portion including:

a first voice frequency line from said telephone system to said radio system,

SF tone detection means coupled to said first voice frequency line and operative in response to cessation or initiation of an SF tone thereon to apply a signal to the radio system turning on the RF carrier; and

a receiving portion including:

an SF tone oscillator,

a second voice frequency line connected to said radio system,

RF carrier detection means operative upon receipt of an RF carrier by said radio system to connect said telephone system to said second voice frequency line, and

SF tone detection means responsive to an SF tone on said line to connect said telephone system to the output of said SF oscillator.

4,138,596

EQUIPMENTS FOR CONNECTING PCM MULTIPLEX DIGITAL TRANSMISSION SYSTEMS HAVING DIFFERENT NOMINAL BIT RATES

Alain Y. Roche, 37 Ave. de Lorraine, Ker Huel Lannion, France (22300)

Filed Aug. 18, 1977, Ser. No. 825,679
Claims priority, application France, Sep. 2, 1976, 76 26950
Int. Cl.[2] H04J 3/00
U.S. Cl. 179—15 BV **6 Claims**

1. A system for interconnecting two different types (a,b) of two-way multiplex systems having the same sampling frequency of recurring bit time periods, where "forward" transmission is from a to b systems and "backward" transmission is from b to a systems, said interconnecting system comprising:

a. forward and backward terminal means in each of said two types of multiplex systems for enabling two-way transmission between any a system and any b system;

b. each forward terminal means in an a system comprising a first serial-to-parallel word converter means connected to the input of a first parallel word memory means and first time slot counter means connected to write an addressing input into the first parallel word memory means;

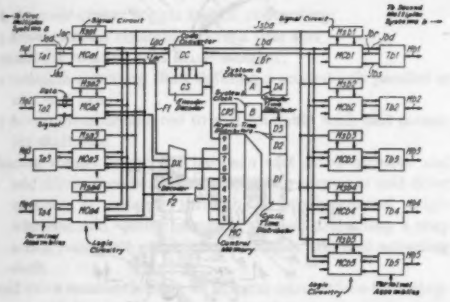
c. each backward terminal means in an a system comprising a second parallel word memory means connected to a first parallel-to-serial word converter means;

d. each forward terminal means in a b system comprising a second parallel-to-serial word converter means;

e. each backward terminal in a b system comprising a first serial word memory means connected to a second serial-to-parallel converter means;

f. means effective during each recurring first time period for associating a given first a system with a given first b system, said first time periods corresponding to the bit timing in the b systems;

g. means for selectively connecting outputs of said first parallel word memory means through forward code converter means to second parallel-to-serial word converter means during said first predetermined recurring time periods;



h. means for selectively connecting inputs of said second parallel word memory means through backward code converter means to said second serial-to-parallel word converter means during said first predetermined recurring time periods;

i. means responsive to said first predetermined recurring time periods for read addressing a first parallel word memory means, for write addressing a second parallel word memory means, for selecting a second parallel-to-serial word converter means and a second serial-to-parallel word converter means; and

j. means for delivering parallel words from a first serial-to-parallel word converter means and from a second parallel word means during second predetermined recurring time periods also corresponding to the bit timing in the b systems.

4,138,597
PCM TIME SLOT EXCHANGE

Donald A. Ashford, Stamford, Conn., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

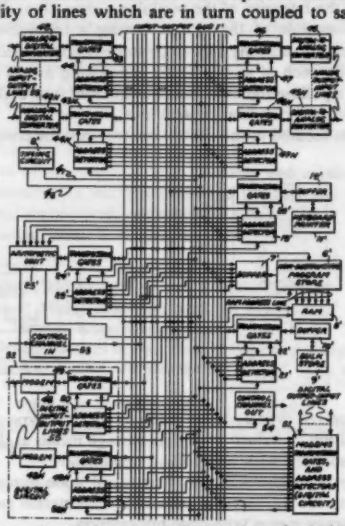
Filed Sep. 6, 1977, Ser. No. 830,525
Int. Cl.[2] H04J *6/02*; H04Q *11/04*
U.S. Cl. 179—15 AS **27 Claims**

1. A time slot exchange for a plurality of peripheral information units comprising:

first means having a plurality of lines, predetermined ones thereof each being coupled to a different one of said units;

second means coupled to each of said predetermined ones of said plurality of lines to sequentially write information in said exchange therein, to store said information in said exchange therein and to read said stored information in said exchange therefrom selectively on command; and

third means coupled to said second means to selectively command said second means and coupled to others of said plurality of lines which are in turn coupled to said first

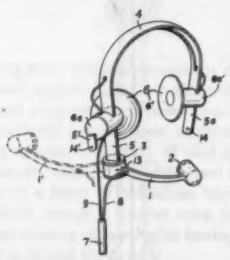


means to selectively control the routing of said information through said exchange to a selected one of said units.

4,138,598
HEADSET CONSTRUCTION

Karl Cech, Mödling, Austria, assignor to AKG Akustische u. Kino-Geräte Gesellschaft m.b.H., Austria

Filed Aug. 26, 1977, Ser. No. 828,091
Claims priority, application Austria, Aug. 30, 1976, 6416/76
Int. Cl.[2] H04M *1/05*
U.S. Cl. 179—156 A **11 Claims**



1. A headset, comprising a head band engageable over the head at least one earpiece having a slot therethrough through which said band extends, and a microphone arm having one end with a microphone thereon and an opposite end with an engagement portion which is slidably engageable on said band.

4,138,599
MODULAR COMMUNICATION SYSTEM HAVING SELF-IDENTIFYING MODULES

Ernst A. Munter, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

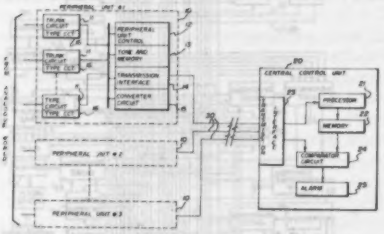
Filed Oct. 31, 1977, Ser. No. 847,237
Int. Cl.[2] H04M *1/24*
U.S. Cl. 179—175 **9 Claims**

1. In an electronic modular system having a central control unit and a plurality of types of modules each one being located at a respective addressable location accessible by the central control unit, said central control unit having data storage means containing type-code information associated with re-

spective ones of the modules of the system, a system for surveying the integrity of the modular system comprising:

each module of the system having a respective memory means containing type-code information associated therewith, each of said modules comprising means responsive to a polling signal for transferring said type-code information to the central control unit;

means located in the central control unit for comparing the



received type-code information with the type-code information contained in its data storage means at the location associated with said polling signal; and

means for generating an error signal upon non-correlation between the received type-code information and the data storage means type-code information.

4,138,600

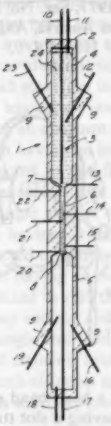
FORCE-RESPONSIVE DEVICE

Karlis V. Ozols, 44 Thorne Ave., Mount Kisco, N.Y. 10549

Filed Apr. 22, 1977, Ser. No. 790,045

Int. Cl.[2] H01H *35/14, 29/00*

U.S. Cl. 200—61.47 **10 Claims**



1. An inertia-operated device for use with a movable body which is capable of acceleration and/or deceleration, comprising

container means forming at least two spaced compartments and at least one flow-restricting capillary passage connecting said compartments and forming the sole communication between them;

a quantity of electrically conductive flowable material in said container means and adapted to flow between said compartments and through said passage as a function of changes in the velocity of said body; and

electrical monitoring means connected to said compartments and said passage and operative for monitoring the position and flow of said material therein as a function of resistance-value changes which result from changes in the position of said electrically conductive flowable material.

4,138,601

SAFETY DEVICE

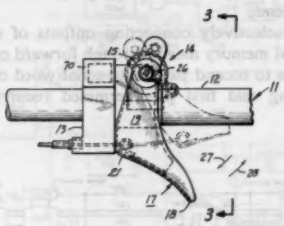
Toshiaki Nakamura, and Hiroshi Sasaki, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

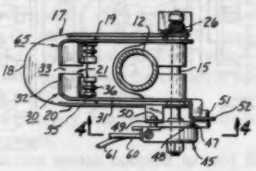
Filed Nov. 11, 1976, Ser. No. 740,786

Claims priority, application Japan, Nov. 21, 1975, 50-158203[U]

Int. Cl.[2] H01H *9/06;* **F02B** *77/00*

U.S. Cl. 200—61.85 **10 Claims**



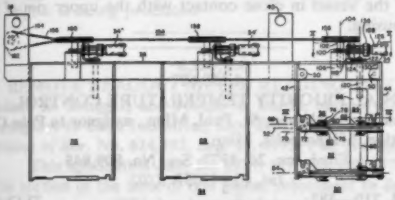


1. A safety device comprising: a pivot means; a lever rotatably supported on said pivot means; first bias means biasing the lever in a first rotational direction, which first bias means can be overcome by exertion of sufficient force on the lever, whereby to rotate the lever in a second, opposite, rotational direction; an operating member rotatably supported on said pivot means, said operating member being movable in said two rotational directions, said operating member being adapted for connection to a spring-biased throttle valve with second bias means that tends to move the operating member in said first direction, and which can be overcome by exertion of a sufficient force on the operating member, whereby to open the throttle valve, said lever and operating member being abutable and independently rotatable on said pivot means, whereby the lever can be rotated in the second direction to abut and rotate the operating member, the said second bias means, when unimpeded, causing the operating member to follow the lever in said first direction, remaining in abutment therewith, the lever being free to continue to rotate independently of the operating member and leave it behind when the latter is restrained; a first switch member and a second switch member interconnected to one another and independently rotatable relative to one another around an axis of rotation; one said switch member being connected to said lever in such a manner that it rotates when the lever rotates, the other said switch member being connected to said operating member in such a manner that it rotates when the operating member rotates; and switching means mounted to both of said first and second switch members whereby to be responsive to the relative rotational orientation of the two switch members, said switching means having a conductive condition in one relative rotational orientation of the two switch members, and a non-conductive condition in another relative rotational position thereof.

4,138,602
OVER-CENTER TOGGLE SWITCH

Edgar R. Eley, Athens, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1977, Ser. No. 847,182
Int. Cl.[2] H01H *21/04*
U.S. Cl. 200—67 R 6 Claims

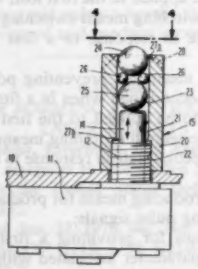


1. An over-center toggle switch comprising:
a drive member rotatable about a first axis;
means for rotating said drive member;
a rotatable actuating shaft defining a second axis parallel to said first axis;
a driven member secured to and rotatable with said actuating shaft; and
biasing means connected between said drive member and said driven member for storing spring energy as said drive member is rotated through a predetermined angle whereon said spring energy is released imparting a snap action rotation to said driven member and said actuating shaft;
said drive member having an integral cam surface for engaging said driven member immediately prior to said release of said spring energy for imparting an initial rotation to said driven member and said actuating shaft.

4,138,603
OPERATOR FOR MICROSWITCHES

George S. Hudimac, Jr., Allentown, Pa., assignor to Mechanical Service Co., Inc., Allentown, Pa.

Filed Oct. 3, 1977, Ser. No. 838,736
Int. Cl.[2] H01H *3/00*
U.S. Cl. 200—153 T 10 Claims

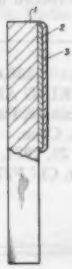


1. An adaptor for use in operating the plunger of an electrical switch comprising:
an elongated body;
an axial, open-ended bore extending thru the body and having a first threaded section extending from one open end toward the center and also having a second, non-threaded section extending from the other open end toward the center, said threads being for use in mounting the adaptor on a switch and the second section being for use in receiving the plunger on the switch;
a plurality of abutments at the open end of said second section;
first and second balls spaced apart and rotatably and axially movably mounted in said second section, the first ball engaging said abutments whereby to be retained in the section and a portion of the first ball extending outwardly of the body so as to be engageable by a switch actuator and the second ball being for use in engaging the plunger of the switch; and
a plurality of intermediate balls rotatably and axially movably mounted in the space between the first and second balls and respectively engaging the same.

4,138,604
ELECTRICAL PLUG-TYPE CONNECTOR

Nils Harmsen; Horst Markhof, both of Bruchköbel; Walter Reichelt, Hanau; Klaus-Ludwig Schiff, and Horst Thiede, both of Bruchköbel, all of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau am Main, Fed. Rep. of Germany

Filed Jul. 16, 1976, Ser. No. 705,919
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1975, 2540943
Int. Cl.[2] H01H *1/02*
U.S. Cl. 200—267 7 Claims



1. Electrical plug-type terminal connector contact element adapted to be wiped against a counter element comprising
a metal electrical plug-type termainal connector substrate and a gold surfaced contact layer in direct contact with and covering at least a portion of said metal plug-type terminal connector substrate, said contact layer consisting essentially of (i) a layer of palladium between about 0.5 and 5 μ m thick which is coated with (ii) a thin and a porous surface coating of hard gold having a thickness of between 0.05 μ m and 0.1 μ m.

4,138,605
THERMAL PRINTING HEAD

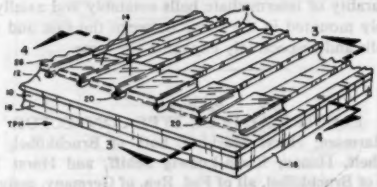
Earl W. Stapleton; Patricia A. McLaughlin, and Jerry E. Turnbaugh, all of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 722,989, Sep. 13, 1976, Pat. No. 4,037,315, which is a continuation of Ser. No. 572,499, Apr. 28, 1975, abandoned, which is a division of Ser. No. 383,955, Jul. 30, 1973, Pat. No. 3,903,393. This application Feb. 22, 1977, Ser. No. 770,721
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 5 Claims

1. A thermal printing head for thermally marking a thermally-sensitive record material comprising:
a substrate member of low thermal-conductivity material having at least one plane surface;
a conductive member secured onto and extending along said plane surface of said substrate member;
conductive means secured onto and extending along said

plane surface of said substrate member and having ends spaced from said conductive member; and

resistive means deposited onto said plane surface of said substrate member and into electrical engagement with said conductive member and respective ends of said conductive means and cutting through said resistive means between adjacent ones of said conductive means thereby forming discrete resistive members connected between said common conductive member and respective ends of



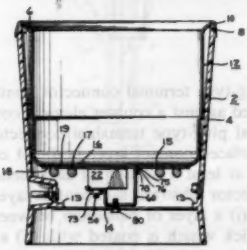
said conductive means, said discrete resistive members having printing surfaces that are located above said conductive member and said conductive means whereby the passage of electrical current through a selected one of said discrete resistive members via said conductive means and said common conductive member will produce a temperature rise of sufficient magnitude to produce a mark on thermally-sensitive record material in engagement therewith.

4,138,606

COOKING APPLIANCE

Richard N. Brown, Macungie, Pa., assignor to General Electric Company, Bridgeport, Conn.

Filed Aug. 29, 1977, Ser. No. 828,896
Int. Cl.[2] F27D *11/00*
U.S. Cl. 219—442 **3 Claims**



1. A cooking appliance comprising:

(a) a housing having outside walls means, inside wall means, an upper rim surrounding an enlarged upper opening, and a lower opening;

(b) a cooking vessel for insertion within said housing, said vessel including side wall means, bottom wall means, and upper outwardly extending flange means positioned over the rim of said housing;

(c) a downwardly extending screw fixed to the bottom wall means of said vessel, and a downwardly extending tab having a slot provided therein, said downwardly extending tab fixed to the bottom wall means of said vessel at a point spaced from said downwardly extending screw;

(d) a lower transverse plate extending across the inside wall means of said housing;

(e) a generally U-shaped bracket having two upwardly extending arms and a lower arm extending between said upwardly extending arms, one of the upwardly extending arms being shaped to provide means for connection with the downwardly extending screw and the other upwardly extending arm being shaped to provide a tab for connection with a bottom portion of the vessel at a point spaced from said screw by inserting the tab at the upper portion of said upwardly extending arm within the slot in the downwardly extending tap of the cooking vessel; and

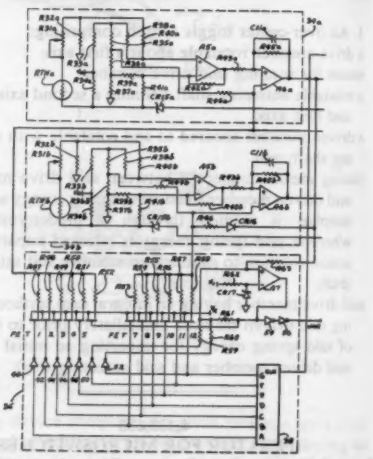
(f) screw connecting means extending through the lower plate and the lower arm of said U-shaped bracket for connecting the U-shaped bracket to the lower plate and for urging the vessel downwardly to hold the upper flange of the vessel in close contact with the upper rim of the housing.

4,138,607

DUAL PRIORITY TEMPERATURE CONTROL

Rudolph H. Engelmann, St. Paul, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Jun. 24, 1977, Ser. No. 809,845
Int. Cl.[2] H05B *3/02*
U.S. Cl. 219—485 **23 Claims**



1. A control system for controlling the operation of first and second loads, the control system comprising:

first switching means for preventing power from being applied to the first load when in a first state, and permitting power to be applied to the first load when in a second state, the first switching means switching from the first to the second state in response to a first triggering pulse signal;

second switching means for preventing power from being applied to the second load when in a first state, and permitting power to be applied to the first load when in a second state, the second switching means switching from the first to the second state in response to a second triggering pulse signal;

triggering pulse producing means for producing the first and second triggering pulse signals;

first detector means for providing a first detector signal indicative of a parameter associated with the first load;

second detector means for providing a second detector signal indicative of a parameter associated with the second load;

first reference signal producing means for producing a first reference signal;

second reference signal producing means for producing a second reference signal;

first inhibit means for providing a first inhibit signal to the triggering pulse producing means to prevent the triggering pulse producing means from producing the first triggering pulse signals when the first detector signal and the first reference signal have a first predetermined relationship;

second inhibit means for providing a second inhibit signal to the triggering pulse producing means to prevent the triggering pulse producing means from producing the second triggering pulse signal until the second detector signal and the second reference signal attain a second predetermined relationship; and

priority means for preventing production of the second triggering pulse signal when the first triggering pulse signal is being produced.

4,138,608

REMOTE READOUT METER READING SYSTEM

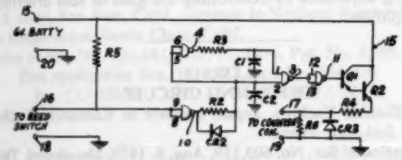
Richard D. Brugger, and Joseph A. Barna, both of Erie, Pa., assignors to Zurn Industries, Inc., Erie, Pa.

Division of Ser. No. 614,192, Sep. 17, 1975, Pat. No. 4,031,362. This application Jun. 20, 1977, Ser. No. 808,037

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

Int. Cl.[2] G06M *3/12*

U.S. Cl. 235—92 FL **2 Claims**



1. A method of metering the flow of a product in a line and indicating the quantity of said flow by a counter **37** at a location remote from said meter comprising,

connecting a meter **40** with an electrical contact on it to a flow line carrying said product,

providing a counter at said remote location, connecting an electrical circuit to said counter through an electronic valve having a control element on it connected through a pulse forming circuit to said contact, using the transition of said contact from open to closed thereby charging a first capacitive means and discharging a second capacitive means to generate an electrical pulse of relatively short time duration of less than a maximum time in said pulse forming circuit for each increment of said product flowing through said line, thereby causing said electronic valve to conduct electricity during the time of said electrical pulses only,

thereby counting said pulses whereby the quantity of each of said increments of said product is counted.

4,138,609

METHOD FOR FORMING ELECTRICALLY CHARGED LASER TARGETS

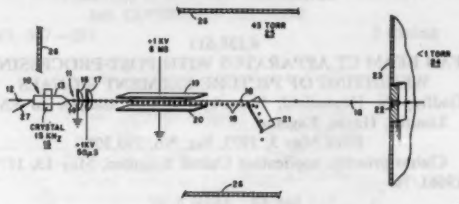
Ronald K. Goodman, Livermore, and Angus L. Hunt, Alamo, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 22, 1976, Ser. No. 698,557

Int. Cl.[2] G21K *1/08*; G21B *1/00*

U.S. Cl. 250—396 R **2 Claims**

1. A method for forming electrically charged targets having increased electrical conductivity for improving the guidance thereof by electrostatic or magnetic guidance mechanism along a predetermined trajectory comprising the steps of: mixing an electrically conductive additive consisting of dilute hydrochloric acid with a target material consisting of ammonia by introducing the electrically conductive dilute hydrochloric acid into a stream of liquid target ammonia material, directing the mixture under pressure through a channel terminating in an orifice, impressing upon the mixture as it passes through the channel a pressure wave of desired amplitude and frequency thereby initiating the formation of drops as it discharges through the orifice, positioning a pair of spaced electrically conductive plates having apertures therein such that the mixture discharging through the orifice passes through the apertures and impressing voltage pulses on the plates such that a liquid mixture segment between the plates during each voltage



pulse is polarized with opposite ends of the liquid mixture segment becoming positively and negatively charged whereupon the drops formed from the opposite ends of each of the liquid mixture segments retain the induced charges.

4,138,610

TOMOGRAPHIC X-RAY APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES

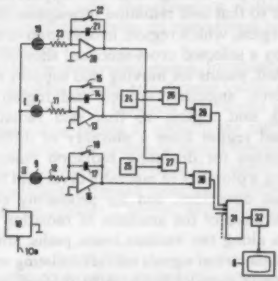
Burghard Weinkauf, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 15, 1977, Ser. No. 787,854

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627433

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—445 T **4 Claims**



1. Tomographic x-ray apparatus for producing transverse layer images of a radiographic subject, including an x-ray measuring arrangement which comprises an x-ray source producing a fan-shaped x-ray beam penetrating the radiographic subject, and a radiation receiver which determines the radiation intensity behind the subject; including a drive system for the measuring arrangement in order to produce rotational movements; and including a measured value converter for the transformation of the signals supplied by the radiation receiver into a layer image; the radiation receiver having a series of detectors, these detectors being arranged for connection at one terminal thereof with a common power supply, and the number of detectors being selected in accordance with the desired picture resolution and having their output signals sampled during each measurement cycle; characterized in that a reference channel is present, having reference response means not exposed to the x-radiation and providing a reference output signal responsive to power supply fluctuations during each measurement cycle, and having a response substantially similar to the response of the detectors of said series with respect to power supply fluctuations, the measuring channels having a multiplier means for multiplying the output signal of the reference channel with a constant representing the deviation in sensitivity of each channel detector from the reference re-

sponse means, and that, in addition, there is present for each measuring channel a subtracter for the output signal of each measuring channel and of the multiplier means, such that the output of each subtracter is corrected for power supply fluctuations occurring between successive measurement cycles.

4,138,611

FAN BEAM CT APPARATUS WITH POST-PROCESSING WEIGHTING OF PICTURE ELEMENT SIGNALS

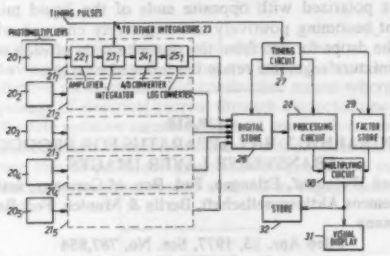
Godfrey N. Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Filed May 3, 1977, Ser. No. 793,390

Claims priority, application United Kingdom, May 13, 1976, 19681/76

Int. Cl.² A61B *6/02*

U.S. Cl. 250—445 T **8 Claims**



1. Radiographic apparatus including a source of a fan-shaped distribution of penetrating radiation, support means supporting said source so that said radiation propagates through a predetermined region, which region, in operation of the apparatus, is occupied by a selected cross-sectional slice of an object to be radiographed, means for moving said support means, and with it said source, angularly around said region, about an axis intersecting said region, so that said radiation propagates through said region from a plurality of different directions, detector means for detecting radiation emergent from said region along a plurality of mutually divergent beam paths from each of said directions, and for producing electrical output signals indicative of the amounts of radiation emergent from said region along the various beam paths, sorting means for sorting said electrical signals into sets relating to respective sets of substantially parallel beam paths through said region, and compensating means for allowing for lack of uniformity of spacing between adjacent beam paths of said sets, said compensating means including means for deriving from said electrical output signals, by a process of convolution, values of the absorption coefficient, with respect to said radiation, appropriate to each element of an array of elements notionally delineated in said slice of said object, means for producing a respective compensating factor appropriate for each of said elements and indicative of error in said derived values and attributable to said lack of uniformity of spacing, and means for combining corresponding ones of said derived values and said compensating factors to produce a representation of the said absorption coefficients in which said error is reduced.

4,138,612

CIRCUIT HAVING ADJUSTABLE CLIPPING LEVEL

Eugene R. Schlesinger, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 12, 1977, Ser. No. 832,155

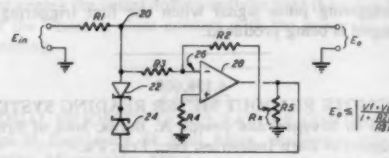
Int. Cl.² H03K *5/08, 1/14*

U.S. Cl. 307—237 **11 Claims**

1. An adjustable clipping circuit for adjustably reducing the clipping level of a passive clipping element comprising, in combination:

an input terminal adapted to be coupled to an external circuit;

a passive clipping element with two terminals for clipping the voltage appearing thereacross, one said clipping element terminal being coupled to said input terminal, said clipping element being conductive in two directions; and



an adjustable gain inverting amplifier with an input and an output, said input being coupled to said input terminal and said output being coupled to said clipping element terminal not coupled to said input terminal, the clipping level being adjustable by controlling the gain of said inverting amplifier.

4,138,613

SWITCHING CIRCUIT

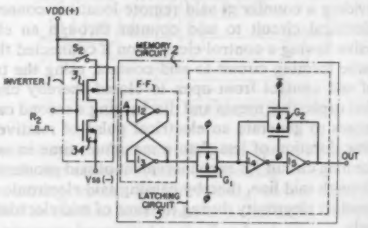
Kojiro Tanaka, Yachiyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Continuation of Ser. No. 603,119, Aug. 8, 1975, abandoned. This application Aug. 9, 1977, Ser. No. 823,163

Claims priority, application Japan, Aug. 14, 1974, 49-93066; Aug. 14, 1974, 49-93067; Aug. 23, 1974, 49-96850; Aug. 29, 1974, 49-99225; Sep. 2, 1974, 49-100663; Sep. 2, 1974, 49-100664

Int. Cl.² H03K *5/01, 3/286*

U.S. Cl. 307—247 A **7 Claims**



1. A switching circuit for receiving an input signal under control of a mechanical switch having chatter and for developing in response thereto a chatter-free output signal, said switching circuit comprising:

a C-MOS inverter circuit comprised of a complementary pair of MOS transistors connected in series, each having a respective gate for receiving a reset signal, and said complementary pair of MOS transistors having an output terminal for developing an inverter output signal thereat;

a mechanical switch connected in series with said series-connected complementary transistor pair and having an open and a closed condition for applying an electrical signal under control of said mechanical switch to said series-connected complementary transistor pair, wherein said inverter circuit developes the inverter output signal when said mechanical switch is closed only in the absence of the reset signal;

a flip-flop circuit connected to receive the inverter output signal as an input signal, and having an output terminal for developing thereat a flip-flop output signal determined by the inverter output signal applied to said flip-flop circuit;

latching circuit means responsive to a clock signal longer than the reset signal and connected to receive the flip-flop output signal for developing said chatter-free output signal corresponding to the flip-flop output signal at a time

the clock signal is applied to said latching circuit means; and

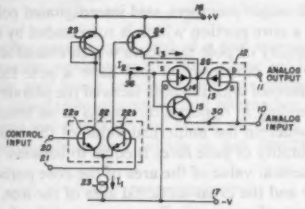
means for developing said clock signal and said reset signal repetitively and out of phase and for applying the reset signal to said inverter circuit and for applying the clock signal to said latching circuit means, respectively, whereby said chatter-free output signal can change only after said inverter circuit receives the reset signal.

4,138,614

JFET SWITCH CIRCUIT

Sam S. Ochi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 754,482, Dec. 27, 1976, Pat. No. 4,085,417.
This application Sep. 16, 1977, Ser. No. 834,220
Int. Cl.[2] H03K *17/60, 17/04, 17/16, 17/72*
U.S. Cl. 307—251 **6 Claims**



1. A JFET-bipolar transistor analog signal switching circuit comprising:

a switching JFET having its source and drain terminals coupled to a pair of analog signal switching terminals, said switching JFET acting as a relatively high impedance between said analog signal switching terminals when its gate capacitance is charged to a potential greater than its pitch off voltage rating and acting as a relatively low impedance between said analog signal switching terminals when its gate capacitance is discharged to a potential lower than its pinch off voltage rating;

a first bipolar transistor having its collector electrode coupled to the gate electrode of said switching JFET and having its emitter electrode coupled to a terminal connectible to a source of potential that exceeds said pinch off voltage rating;

a second bipolar transistor having its collector electrode coupled to the gate electrode of said switching JFET and having its emitter electrode coupled to a terminal connectible to a source of potential that is less than said pinch off voltage rating;

a driver JFET connected as a source follower having its source coupled to the base of said second bipolar transistor and to a constant current source, the gate of said driver JFET being coupled to said gate of said switching JFET;

means for supplying a first switching signal to said first bipolar transistor; and

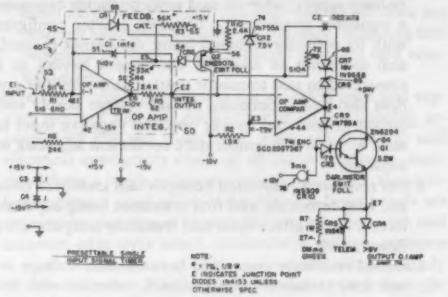
means for supplying a second switching signal, complementary to said first switching signal, to said constant current source whereby when said first bipolar transistor is on said switching JFET is off and when first bipolar is off said switching JFET, said second bipolar transistor, and said driver JFET are on.

4,138,615

PRESETTABLE INTEGRATING TIMING CIRCUIT

James R. McKinlay, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 6, 1977, Ser. No. 830,721
Int. Cl.[2] H03K *5/153, 13/02*
U.S. Cl. 307—293 **3 Claims**



1. A presettable integrating timer, capable of comparing the time-volt product of an input with a preset signal, comprising:

means, comprising an input and an output, for integrating an electrical signal at the input into an integrated signal at the output, the means for integrating being an operational amplifier (op amp) integrator;

means, having two inputs, one input being connected to the output of the integrating means, the other input being connectable to a reference voltage, the means being capable of comparing the magnitude of a signal appearing at the first named input with the reference voltage, the means for comparing comprising an operational amplifier (op amp) comparator;

means, connected to the integrating means, for clamping the input of the integrating means at a desired value; and

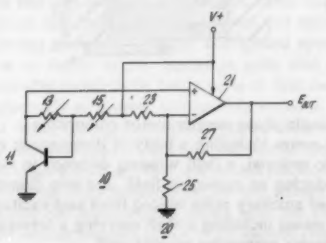
a feedback circuit, connected between the output and the input of the integrating means to prevent the integrating means from saturating, the feedback circuit comprising a series combination, connected between the output and the input of the operational amplifier integrator, comprising a resistor, a diode, an emitter follower, another diode, and another resistor.

4,138,616

VARIABLE SLOPE TEMPERATURE TRANSDUCER

Robert B. Turner, Weymouth, Mass., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 12, 1977, Ser. No. 758,628
Int. Cl.[2] H03K *1/14;* **G01K** *7/00*
U.S. Cl. 307—310 **1 Claim**



1. A variable slope temperature sensitive transducer circuit for use with electronic thermometers and the like which provide a supply voltage and ground to said circuit, comprising:

a temperature sensitive semiconductor component having a

plurality of terminals, said component being connected to said supply voltage and said ground and presenting a reference voltage output which varies with ambient temperature according to the temperature coefficient of said semiconductor component; and

means for adjusting said semiconductor component temperature coefficient, said means being connected across two terminals of said semiconductor component and to said voltage supply; wherein said semiconductor component is a transistor connected in common emitter configuration with its collector terminal being the output thereof, and also including an amplifier component having an input connected to said transistor output, said amplifier component also being connected to said voltage supply and said circuit ground and having plus and negative input terminals; wherein said temperature coefficient adjusting means includes:

a first resistance connected between said transistor collector and base terminals, said first resistance being adjustable to have a direct effect upon said transistor temperature coefficient; and

a second resistance connected between said voltage supply and said transistor base terminal, wherein said voltage supply is a positive voltage supply; wherein said transistor is an NPN transistor; wherein said transistor output is connected to the plus input of said amplifier component; wherein said amplifier component is connected to said ground through a third resistance connected to the negative input of said amplifier component; and wherein said amplifier component is connected to said voltage supply through a forth resistance connected to the negative input of said amplifier component; and also including a fifth feedback resistance connected between the negative input and the output of said amplifier component.

4,138,617

SINGLE PHASE STEPPER MOTOR

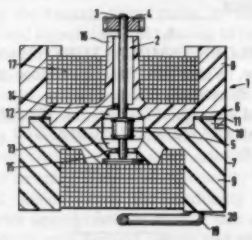
Roland Sudler, Frankfurt am Main, Fed. Rep. of Germany, assignor to Quartz-Zeit AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 22, 1977, Ser. No. 789,874

Claims priority, application Fed. Rep. of Germany, May 13, 1976, 2621262

Int. Cl.[2] H02K *37/00*

U.S. Cl. 310—49 R **11 Claims**



1. A single phase stepper motor comprising

stator means including a body of diamagnetic or paramagnetic material, a field winding disposed in said body for producing an excitation field, and two diametrically opposed auxiliary poles spaced from said excitation field;

rotor means including a shaft carrying a driving pinion and a bipolar permanent magnet; and

bearing means rotatably supporting said rotor means in said stator body with the axis of said rotor shaft transverse to the direction of said excitation field,

said permanent magnet being constructed of a lanthanide ferromagnetic alloy and having a moment of inertia substantially the same as or less than the moment of inertia of the combination of said rotor shaft and said driving pinion.

4,138,618

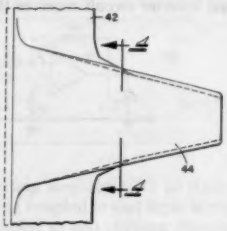
SPREAD POLE EDDY CURRENT COUPLING

Ralph L. Jaeschke, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 2, 1977, Ser. No. 792,632

Int. Cl.[2] H02K *49/02*

U.S. Cl. 310—105 **12 Claims**



1. An eddy current coupling comprising an input member, an output member rotatable relative to said input member, an interdigitated pole assembly associated with one of said input and output members, a field coil surrounding a portion of said interdigitated pole assembly for coupling said input and output members, and an inductor member associated with the other of said input and output members, said interdigitated pole assembly including a core portion which is surrounded by said field coil and a plurality of pole members which extend at one end thereof from said core portion and have a pole face at the opposite end thereof with the pole faces of the plurality of pole members extending in opposite directions in an interdigitated fashion, and wherein the numerical value of the total surface area of the plurality of pole faces is equal to between 2.2 and 3 times the numerical value of the area of the core portion of the pole assembly and the cross-sectional area of the iron, through which the lines of magnetic flux pass in each of said pole members, gradually increases between the core portion of the pole assembly and the pole faces of the pole assembly as the cross-sectional area of the iron approaches the pole faces of the pole member.

4,138,619

ALTERNATING CURRENT ELECTRIC MOTORS AND GENERATORS

Alexander R. W. Broadway; William Fong, and Gordon H. Rawcliffe, all of Bristol, England, assignors to National Research Development Corporation, England

Continuation of Ser. No. 581,280, May 27, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,688

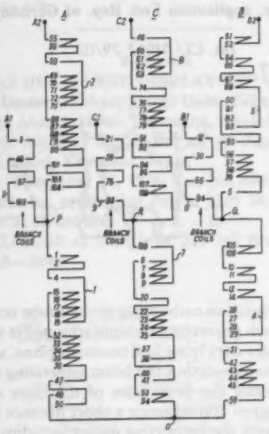
Claims priority, application United Kingdom, Jun. 12, 1974, 26040/74

Int. Cl.[2] H02K *3/00*

U.S. Cl. 310—184 **10 Claims**

1. For use in a 3-phase alternating current, pole-amplitude modulation pole-changing electric machine, having a 3phase stator winding comprising three phase-windings, each phase-winding having two phase-winding parts, arranged for alternative series/parallel connection together, said phase winding parts comprising a majority but not all of the coils of the phase winding, which parts are serially connected together for a first pole-number and connected together in parallel for a second pole-number; a method of connecting the said coils of each phase-winding to provide an air-gap flux density ratio, for the two pole-numbers, which is close to unity, said method comprising modifying the said machine from a form in which said coils are identical throughout and are all energized for each pole-number, in that the said two phase-winding parts together comprise all coils of the phase-winding, by excluding selected coils from circuit in the serial connection for one-pole number; the step of excluding selected coils comprising determining the slot-vector for all coils of all three phase-windings when all

coils are energized in the said parallel connection, thereby to define three adjoining phase vector groups, one group for each phase, each group subtending 120° around the stator winding periphery and selecting the said selected coils in groups of three pairs, each pair of the three pairs occupying a corresponding vector angular position within each of the three said



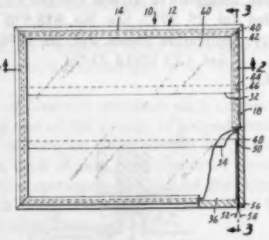
phase vector groups, each coil of a pair occupying the same vector angular position in the same phase vector group, one coil of the pair being selected from that phase-winding part which is reversed in circuit by said alternative series/parallel connections and the other coil of the pair being selected from that phase-winding part which is not reversed in circuit thereby.

4,138,620

MULTI-PANEL ELECTROLUMINESCENT LIGHT ASSEMBLY

Arthur D. Dickson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 24, 1978, Ser. No. 890,024
Int. Cl.[2] H05B *33/12*; G09F *13/04, 13/22*
U.S. Cl. 313—1 **4 Claims**



1. A multi-panel electroluminescent light assembly comprising

(a) a substantially planar support member,

(b) an array of at least two electrical conductors electrically insulated from each other and extending in spaced and substantially co-planar relationship across said support member,

(c) a plurality of substantially identical electroluminescent panels, each of which include the following members:

(i) a laminate of electroluminescent layer sandwiched between two sheet-like electrode layers, at least one of which is substantially transparent wherein the layers of the laminate terminate along at least one common edge enabling the substantially uniform emission of light per unit area throughout said electroluminescent layer, including that area thereof which is immediately adjacent said common edge and away therefrom,

(ii) at least two metal mesh strips electrically connected to each of the electrode layers and extending co-planar therewith and away therefrom, and

(iii) a transparent, weather-resistant, substantially moisture impermeable envelope through which said metal mesh strips extend along one edge and which does not obstruct light emitted from said laminate, including that produced by the area immediately adjacent said common edge,

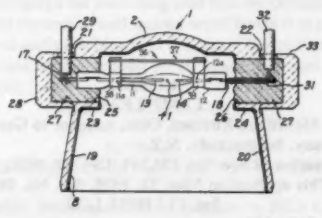
wherein said plurality of panels are mounted onto said support member adjacent each other in an overlapping arrangement and said metal mesh strips connected to said electrical conductors enabling all the panels to be energized from a single external power source, such that non-light emitting areas along some edges of some panels are covered by portions of other panels terminating with said common edge over which substantially uniform emission is produced, thereby providing a substantially uniformly illuminated area extending over all of the panels throughout which non-illuminated bands corresponding to electrode connections or the like within each panel are eliminated, thus providing a panel suitable for uniformly backlighting graphic transparencies placed thereover.

4,138,621

SHORT-ARC DISCHARGE LAMP WITH STARTING DEVICE

Robert D. Downing, Mentor, and John C. Sobieski, Richmond Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,272
Int. Cl.[2] H01J *5/16, 61/54*
U.S. Cl. 313—113 **7 Claims**



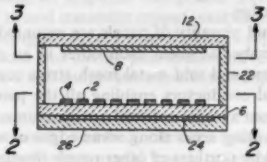
1. An arc discharge lamp comprising an envelope having a bulb portion and first and second elongated stems respectively extending from said bulb portion, and first and second electrodes extending into said envelope and spaced apart in said bulb portion to define an arc discharge path, said first and second electrodes respectively being parts of first and second elongated electrode structures, respectively sealed in said first and second stems at regions thereof spaced from said bulb portion, the inner surfaces of said first and second stems being respectively spaced from said first and second electrodes therealong between said bulb portion and first and second junction points at which the stems make contact with the electrodes, said first and second junction points being located respectively between said bulb portion and said first and second electrode structure seals, wherein the improvement comprises a starting device of electrically conductive material positioned externally of said envelope and extending from the vicinity of said first junction point to the vicinity of said second junction point, said starting device not being connected to carry the voltage of either of said electrodes.

4,138,622

HIGH TEMPERATURE ELECTRONIC GAIN DEVICE

J. Byron McCormick; Steven W. Depp, both of Los Alamos, N. Mex.; Douglas J. Hamilton, and William J. Kerwin, both of Tucson, Ariz., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 4, 1977, Ser. No. 821,870
Int. Cl.[2] H01J 1/46, 21/10; H01K 11/00
U.S. Cl. 313—306 5 Claims



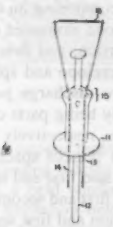
1. An electron discharge device comprising:
an evacuated sealed envelope of refractive insulating material, said envelope having first and second planar, parallel opposed surfaces;
a forklike cathode electrode deposited on said first surface;
a forklike grid electrode interdigitally arranged with said cathode electrode deposited on said first surface;
said cathode and grid electrodes having like widths and distance from one another; and
an anode deposited on said second surface.

4,138,623

LAMP LEADS

John E. McMillan, Kirtland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 734,567, Oct. 21, 1976, abandoned.
This application Mar. 23, 1978, Ser. No. 889,265
Int. Cl.[2] H01J 5/50
U.S. Cl. 313—331 8 Claims



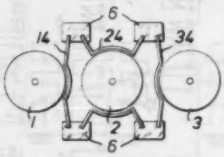
1. A general service incandescent lamp having
a mount comprising at least two inner lead wires;
a refractory filament clamped one end to each of said lead wires;
wherein the improvement comprises at least a portion of said lead wires comprising dispersion strengthened copper wire and at least said lead wires are unsupported.

4,138,624

COLOR TELEVISION CATHODE RAY TUBE GUN MOUNTING

Reinhard Srowig, Unterelchingen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 15, 1977, Ser. No. 833,706
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642560
Int. Cl.[2] H01J 29/02
U.S. Cl. 313—417 6 Claims



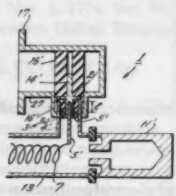
1. In a color television cathod-ray picture tube composed of three electron beam generating systems arranged in a line, with their electron beam axes lying in a common plane, a phosphor screen, and means supporting the beam generating systems in positions for causing the beam axes of the three systems to intersect at a point of convergence a short distance in front of the phosphor screen, the supporting means including insulating bars and fastening members positively connecting each of the outer ones of the generating systems to the center generating system through the intermediary of one of the insulating bars, the improvement wherein said fastening members comprise fastening clamps connected between said center generating system and said insulating bars and having a form which varies with temperature for displacing each said outer generating system relative to said center generating system during heating of said systems in a manner to tilt the electron beam axes of said outer systems relative to that of said center system by an amount which substantially compensates for skewing of the beam axes of said outer systems due to heating.

4,138,625

HELIX TYPE TRAVELLING-WAVE TUBE AMPLIFIER

Kaoru Koyama; Tsutomu Kyuzaki, and Toshimoto Kikuchi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Japan

Filed Jul. 25, 1977, Ser. No. 818,570
Claims priority, application Japan, Jul. 26, 1976, 51-88864
Int. Cl.[2] H01J 25/34
U.S. Cl. 315—3.5 10 Claims



1. A travelling-wave tube amplifier comprising a helix type travelling-wave tube including an electron gun for emitting and forming an electron beam, a collector for receiving said electron beam, a helix slow-wave circuit disposed between said electron gun and said collector and surrounding said electron beam for generating an electro-magnetic wave around said electron beam as excited by a high frequency signal applied to the end of said helix slow-wave circuit closest to said electron gun, an evacuated envelope receiving said electron gun, said collector and said slow-wave circuit, coaxial input and output terminals each consisting of an outer conductor hermetically

connected to said envelope and a coaxial inner conductor insulated from its respective outer conductor and coupled to said slow-wave circuit, and coupling means connected to said coaxial output terminal of said travelling-wave tube for forming, in cooperation with said coaxial output terminal, a band-rejection filter for rejecting at least a portion of the second harmonic of the fundamental frequency inherent to said travelling-wave tube.

4,138,626
GAS DISCHARGE DISPLAY APPARATUS

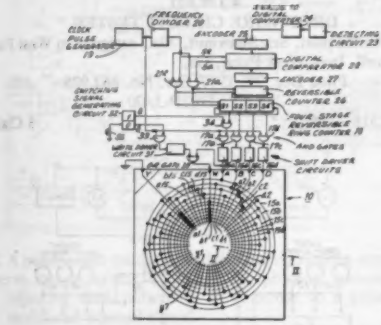
Tomoyuki Unotoro, Tokyo; Yoichi Ueda, Takarazuka; Yasunari Shirouchi, Akashi; Hideo Yamashita, Akashi; Sei Sato, Kobe, and Kenji Murase, Kakogawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 26, 1976, Ser. No. 690,021

Claims priority, application Japan, May 28, 1975, 50-64647; May 28, 1975, 50-64648

Int. Cl.[2] H05B *41/14, 41/44;* 315 *169 R;169 TV;84.6*

U.S. Cl. 315—169.4 **3 Claims**



1. Gas discharge display apparatus, comprising

a gas discharge panel having a first substrate, a plurality of looped electrodes concentrically arranged on the first substrate, the looped electrodes being in a plurality of groups, a first dielectric layer coating the looped electrodes at a surface of the first substrate, a second substrate, a plurality of radially extending shift electrodes arranged regularly on the second substrate, a second dielectric layer coating the shift electrodes at a surface of the second substrate, said substrate being positioned face to face with a gap therebetween, said gap being filled with an ionizable gas;

a plurality of common terminals each connected to a corresponding one of the groups of looped electrodes;

a plurality of common drive circuits for providing operating voltages, each of said common drive circuits being connected to a corresponding one of the common terminals and each being individually controlled for applying a corresponding timing drive;

a plurality of shift electrode terminals;

a plurality of buses each connecting the shift electrodes sequentially to a corresponding shift electrode terminal;

a write driver circuit for applying a write voltage, said write driver circuit being connected to at least one of the shift electrodes for generating a plurality of discharge spots on said one of said shift electrodes at a starting time;

a plurality of shift drive circuits for providing shift voltages sequentially for shift operation, said shift driver circuits being connected respectively to said buses for shifting the discharge spots from a given shift electrode to an adjacent shift electrode along each of said groups of said looped electrodes wherein a plurality of indication lines each displayed on the respective groups of said looped electrodes are shifted to rotate at a selected rate; and

a control circuit including counter means for switching the timing of application of the shift voltage to the buses from the shift driver circuits and for controlling the timing of application of the operating voltages to at least one of the common terminals from at least one of the common drive circuits.

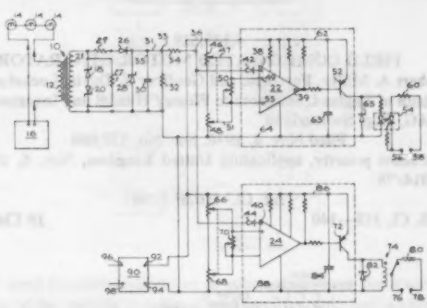
4,138,627
CURRENT-LEVEL-SENSITIVE SWITCHING SYSTEM

Donald L. Camic, Granada Hills, Calif., assignor to Hughey and Phillips, Inc., Burbank, Calif.

Continuation of Ser. No. 609,286, Sep. 2, 1975, abandoned. This application Dec. 12, 1977, Ser. No. 859,805

Int. Cl.[2] H05B *37/02*

U.S. Cl. 315—313 **5 Claims**



1. An airport lighting system having first and second sets of electric lamps, said first set of lamps being operated only in low ambient light levels, said second set of lamps being operated at a first finite current level in normal daylight and at a second finite current level at low ambient light levels;

sensing means coupled to said second set of lamps for sensing said first and second current levels respectively; and,

switching means coupled to said sensing means and to said first set of lamps for switching said first set of lamps "off" when said current to said second set of lamps is at said first finite level and switching said first set of lamps "on" when said current to said second set of lamps is at said second finite level.

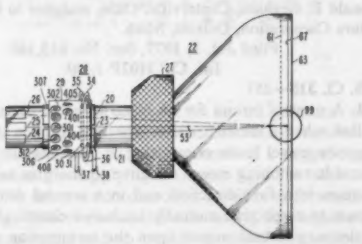
4,138,628
MAGNETIZING METHOD FOR USE WITH A CATHODE RAY TUBE

Joseph L. Smith, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 26, 1977, Ser. No. 819,095

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—368 **14 Claims**



1. A method of creating magnetized regions within a magnetic material to be located adjacent a neck portion of a cathode ray tube, said magnetized regions producing an electron beam moving magnetic field for moving at least one electron

beam within said cathode ray tube in a predetermined manner, comprising the steps of:

developing an appropriate magnetizing field that will magnetize magnetic zones within said magnetic material for creating said magnetized regions for producing said electron beam moving magnetic field; and

applying to each of said magnetized regions an alternating polarity component magnetizing field for eliminating from said electron beam moving magnetic field a component contributed by relatively easily demagnetizable magnetic zones within said magnetized regions for stabilizing said magnetized regions and preventing substantial changes from occurring in the values of said electron beam moving magnetic field.

4,138,629

FIELD COMPENSATED MOTOR/GENERATOR

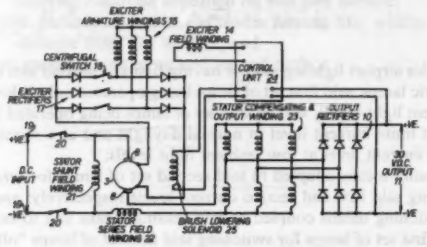
Robert A. Miller, Fareham, and Geoffrey E. Davis, Locksheath, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Nov. 4, 1976, Ser. No. 739,004

Claims priority, application United Kingdom, Nov. 6, 1975, 46014/75

Int. Cl.[2] H02P *7/66*

U.S. Cl. 318—140 **16 Claims**



1. A rotary electric motor/generator comprising a stator assembly including a single stator, a motor energizing winding and a generator output winding carried by said single stator, a rotor rotatable relative to said stator assembly, a rotor winding carried by said rotor, and means, associated with said generator output winding and said rotor winding, for compensating for rotor reaction by causing an interconnection between said generator output winding and said rotor winding when said motor/generator is operating as a motor.

4,138,630

ELECTRIC MOTOR REVERSING CONTROL SYSTEM

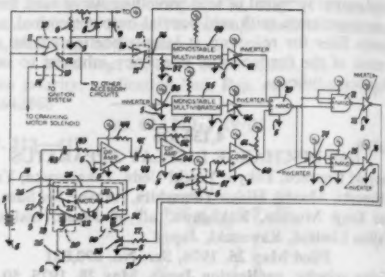
Donald E. Graham, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 5, 1977, Ser. No. 813,166

Int. Cl.[2] H02P *1/40*

U.S. Cl. 318—257 **7 Claims**

1. A control circuit for an electric motor capable of being stalled when a member driven thereby reaches either of two opposite travel limits comprising in combination: electrically operable switching means effective to energize said motor for rotation in a first direction and in a second direction in response to respective mutually exclusive electrical signals and to deenergize said motor upon the termination thereof; and circuit means for producing a first electrical signal upon the application of a control signal thereto and a second mutually exclusive electrical signal upon the removal of said control signal therefrom, for applying the one of said electrical signals so produced to said electrically controllable switching means, for maintaining the one of said electrical signals so produced while said motor is in the run mode and for terminating the one



of said electrical signals so produced upon motor stall when said driven member has reached a said travel limit.

4,138,631

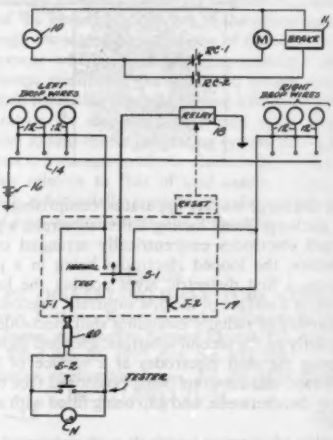
DROP WIRE CIRCUIT TESTER

John C. Sedenquist, Sr., Shawmut, Ala., assignor to West Point Pepperell, Inc., West Point, Ga.

Filed Dec. 21, 1977, Ser. No. 862,909

Int. Cl.[2] H02P *3/00*

U.S. Cl. 318—490 **5 Claims**



1. An improved arrangement for testing the operability of drop wires associated with motor operated yarn handling equipment, including:

a first power supply for energizing said motor;

relay contact means for connecting said power supply to the motor in accordance with the condition of said relay contact means; and

drop wire circuitry, said circuitry including a second power supply, a conductive bus joined to the second supply, and a relay operatively associated with the drop wires whereby when at least one of said drop wires electrically engages the bus, a circuit is completed from the second power supply to energize the relay; the improvement comprising:

a first switch operable between normal and test positions, said switch in the normal position connecting said drop wires to the relay;

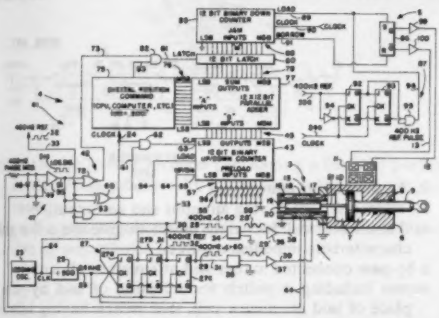
normally closed contact jack switch means joined to said drop wires and said first switch whereby when said first switch is in the test position, said drop wires are connected through the jack switch contacts to said relay; and

a tester device including a jack adapted to engage the jack switch means to open its contacts, said tester further comprising indicator means electrically connected across the jack switch contacts when said jack engages the jack switch so as to be energized when a drop wire engages the bus.

4,138,632
PULSE WIDTH MODULATOR DIGITAL SERVO SYSTEM

Michael A. Pauwels, Kalamazoo, and Sydney K. Tew, Portage, both of Mich., assignors to Pneumo Corporation, Boston, Mass.

Filed Apr. 4, 1977, Ser. No. 784,335
Int. Cl.² G05B *11/28*
U.S. Cl. 318—599 **42 Claims**



1. A pulse width modulator digital servo system, comprising

servo means having a changeable physical parameter for adjusting such parameter in response to a pulse width modulated control signal,

transducer means for producing a transducer signal indicative of the actual state of such parameter,

digital means coupled to said transducer means for producing digital information indicative of the actual state of such parameter and a desired state thereof, including

detector means for directly converting such transducer signal to a digital feedback signal, and

command means for combining command information indicative of the desired state of such parameter with such feedback signal to produce such digital information, and

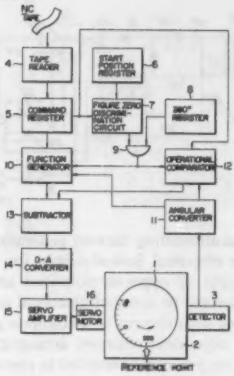
pulse width modulating output means coupled to said digital means and to said servo means for developing such control signal and pulse width modulating the same in accordance with such digital information.

4,138,633
POSITION CONTROL APPARATUS FOR CIRCULAR TABLES

Yasumasa Narikiyo, Aichi, and Osamu Baba, Nagoya, both of Japan, assignors to Okuma Machinery Works Ltd., Nagoya, Japan

Continuation-in-part of Ser. No. 672,010, Mar. 30, 1976, abandoned. This application Sep. 19, 1977, Ser. No. 834,711
Claims priority, application Japan, Apr. 3, 1975, 50-41551
Int. Cl.² G05B *19/28*
U.S. Cl. 318—603 **3 Claims**

1. A position control apparatus for a circular table used with machine tools and the like, comprising a start position register for storing a starting position of the table, a figure zero discrimination circuit for comparing the starting position with a command position produced from a command register, said figure zero discrimination circuit discriminating whether or not said command position is such that the output of an absolute position detector for the table passes over figure zero, an angular converter for converting the output of the absolute position detector into an angular value output, an operational comparator for causing an angular value of 360° to be added to or subtracted from the angular value output of said angular converter in the presence of the output of said figure zero discrimination circuit, said operational comparator producing the angular value output of said angular converter in the absence of the output from said figure zero discrimination circuit, a 360° register for storing data representing the angular value of

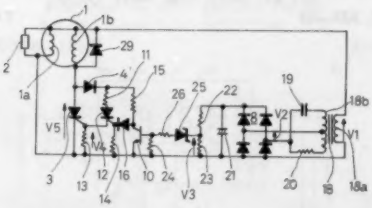


360° used for said addition to or subtraction from the angular value of the starting position of said circular table, said addition or subtraction being performed in a function generator and said operational comparator, said apparatus operating in such a manner that the sudden change in the values which occur when the output of said absolute position detector passes over the figure zero is processed as smoothly as if continuous numerical values are involved.

4,138,634
AUTOMATIC VOLTAGE REGULATOR FOR AN AC GENERATOR WITH A FIELD WINDING

Hideki Yukawa, Susono, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Jun. 27, 1977, Ser. No. 810,016
Claims priority, application Japan, Jul. 19, 1976, 51-95840[U]
Int. Cl.² H02J *7/24;* H02P *9/30*
U.S. Cl. 322—28 **5 Claims**

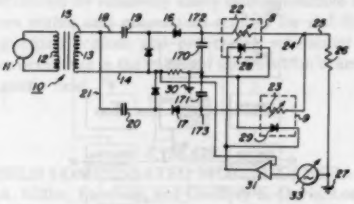


1. An automatic voltage regulator for an AC generator with a field winding comprising at least one controlled rectifier for conducting the field current of the generator; a trigger signal supplying means for supplying a trigger signal to said controlled rectifier when said controlled rectifier is forward biased, a voltage detection circuit for detecting the output voltage of the generator, and an inhibiting circuit for inhibiting turn-on of said controlled rectifier when the instantaneous value of the output of the voltage detection circuit exceeds a predetermined value, characterized in that said voltage detection circuit comprises a phase shifting circuit shifting the phase of the output voltage of the generator.

4,138,635
ALTERNATING CURRENT GENERATOR USING LIGHT DEPENDENT RESISTOR

Halsey P. Quinn, Rancho Palos Verdes, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 9, 1977, Ser. No. 804,966
Int. Cl.[2] G05F *1/64*
U.S. Cl. 323—21 8 Claims

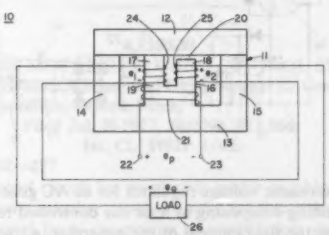


1. An electrical alternating current generator comprising
a high voltage electrical power supply for supplying high voltage current of opposite polarities and having dual outputs connected to conduct electrical current in opposite directions with respect to a common ground,
separate light dependent resistors arranged in series with each of said outputs and connected in circuit to an electrical load,
separate light emitting means arranged in optical communication with separate ones of said light dependent resistors,
differential amplifying means having one input from said load circuit,
signal generating means for providing a low voltage reference signal as an input to said differential amplifying means, whereby said differential amplifying means acts through said light emitting diodes to cause the impedence of said light dependent resistor to conform thereto, thereby controlling the current supplied to said electrical load.

4,138,636
VOLTAGE REGULATING TRANSFORMER HAVING EI LAMINATIONS AND TWO CENTER LEGS OF DIFFERENT RELUCTANCE

Arnold J. Liberman, Skokie, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 13, 1977, Ser. No. 805,685
Int. Cl.[2] G05F *3/02*; H01F *39/00*
U.S. Cl. 323—45 7 Claims

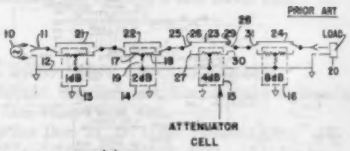


1. A shell-type voltage regulating transformer for use with a substantially constant impedance load comprising:
a magnetic core comprising a stack of EI laminations with a center portion having a pair of legs, one leg defining a first magnetic path characterized by a relatively low reluctance, the other leg including a high reluctance section and defining a second magnetic path characterized by a relatively high reluctance:
a primary winding wound about said center portion for coupling with both of said magnetic paths;
a first secondary winding wound about said one leg for coupling only with said first magnetic path; and
a secondary winding wound about said other leg for coupling with said second magnetic path, said secondary windings being connected in series opposing relationship across said load.

4,138,637
ATTENUATOR WITH COMPENSATION OF IMPEDANCE ERRORS

Fritz K. Weinert, Gaithersburg, Md., assignor to Weinschel Engineering Co., Gaithersburg, Md.

Filed May 31, 1977, Ser. No. 801,873
Int. Cl.[2] H01P *1/22*
U.S. Cl. 323—74 16 Claims



1. An attenuator comprising
an attenuator cell having an input and an output,
said attenuator cell including means to give the cell a given characteristic impedance,
a by-pass connected across said attenuator cell, and
means including a switch for selection of said by-pass in place of said attenuator cell, said switch having inherent resistance,
wherein the improvement comprises:
impedance means connected to said switch to form at least one network, which network includes the inherent resistance of said switch, having a characteristic impedance equal to said given characteristic impedance of said attenuator cell.

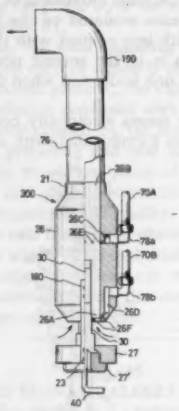
4,138,638
APPARATUS FOR EXAMINING LIQUID QUALITY

Kenichi Amano, and Noboru Furuya, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Continuation of Ser. No. 609,795, Sep. 2, 1975, abandoned. This application Oct. 5, 1977, Ser. No. 839,740
Claims priority, application Japan, Sep. 6, 1974, 103337; Sep. 9, 1974, 103669; Oct. 31, 1974, 126295; Dec. 24, 1974, 1563
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—29 11 Claims

1. An apparatus for determining amounts of matter dissolved and suspended in a test liquid, which amounts serve to indicate characteristics of the test liquid for cleaning a sensing surface of a sensing element (30) and for preventing the decrement of the test liquid, the apparatus comprising:
(a) means for sensing matter dissolved in the test liquid, including a sensing device (20) which includes a tubular casing (26), provided with at least one opening portion (26*a*, 26A, 26B) allowing the test liquid to flow in and out, said sensing surface of the sensing element (30) being disposed in said casing 26 at the liquid to detect amounts of matter,
(b) air-bubble means in the vicinity of said sensing element for producing turbulent flow responsive to the substantially disordered motion including a normal line direction of said sensing surface and the buoyance of air bubbles in the vicinity of said sensing surface, said generating means having an air spraying member (27, 26D) integrated with a lower portion of said casing and an air spraying hole (27*b*, 26F) disposed on a lower side of said sensing element,
(c) means for supplying air to the interior of said air-bubble

generating means, including an air conduit (70, 70B) communicating at one end with the interior of said air spraying member,



(d) a tubular joining member (21) having a first end portion connected in substantially liquid-tight relationship to said casing,

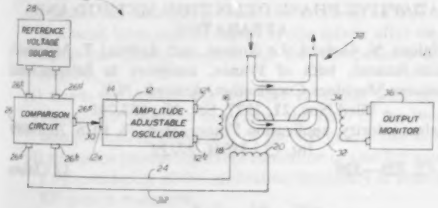
(e) and a pipe member (76) connected to a second end portion of said tubular joining member.

4,138,639

FLUID CONDUCTIVITY MEASUREMENT

Thomas B. Hutchins, 310 NW. Brynwood La., Portland, Oreg. 97229

Filed Jul. 14, 1977, Ser. No. 815,585
Int. Cl.² G01N *27/42*
U.S. Cl. 324—30 A **2 Claims**



1. Electrical apparatus with feedback stabilization for measuring the conductivity of a fluid comprising

spaced primary and secondary transformer winding means,

fluid conduit means, for containing a fluid whose conductivity is to be measured, electrically coupling said winding means,

output-level-controllable oscillator means connected to energize said primary winding means and including an output-level-control input,

feedback means operatively coupling said primary winding means and said input, operable, with said oscillator means oscillating, and in cooperation with said input and said primary means, to inhibit any tendency of the output level of the oscillator means to change, and

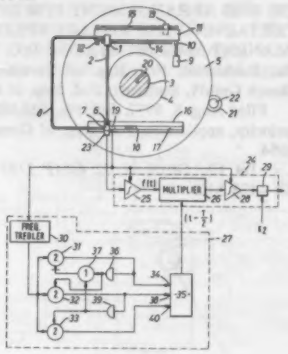
signal output means operatively connected to said secondary winding means, constructed, with said apparatus functioning, to produce an output signal having an electrical characteristic which is directly relatable to the conductivity of any fluid contained in said fluid conduit means.

4,138,640

MEASURING ARRANGEMENTS FOR ELECTRICAL CURRENTS

Charles P. Cousins, London, England, assignor to EMI Limited, Hayes, England

Filed Apr. 30, 1976, Ser. No. 682,159
Claims priority, application United Kingdom, May 14, 1975, 20282
Int. Cl.² A61B *6/02*; G01R *19/00, 23/00*
U.S. Cl. 324—76 A **7 Claims**



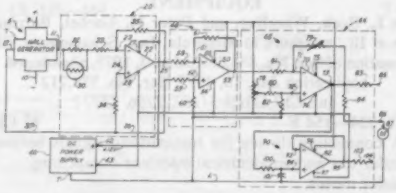
1. A measuring arrangement for electrical current comprising an integrating circuit for receiving said current and for producing signals representative of the integral of said current during a prescribed time interval, means for producing factor signals indicative of a function which exhibits a known variation during said time interval, means for combining said signals representative of the integral of said current with corresponding ones of said factor signals to produce corresponding combined signals and a further integrating circuit for integrating said combined signals for a period substantially equal to said prescribed time interval, to obtain a statistical estimation of the mean value of said current over said period.

4,138,641

INSTRUMENT AMPLIFIER AND LOAD DRIVER HAVING OFFSET ELIMINATION AND COMMON MODE REJECTION

Richard A. Karlin, and Kirk K. O. K. Rim, both of Chicago, Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Filed Apr. 18, 1977, Ser. No. 788,421
Int. Cl.² G01R *1/30*; H03F *3/45, 1/26*
U.S. Cl. 324—123 R **23 Claims**



22. In a system comprising a signal generator capable of generating a transducer voltage comprising a source voltage component generated between first and second generator terminals and an offset voltage component generated between the second generator terminal and a load terminal, an improved method of driving a load connected to the load terminal with a load voltage proportional to the source voltage component comprising the steps of:

amplifying the source voltage without substantially chang-

ing the offset voltage to form an amplified voltage comprising an amplified source voltage component and the offset component;

substantially eliminating the offset component from the amplified voltage to form a difference voltage proportional to the source voltage; and

driving the load with the difference voltage.

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METHOD AND ARRANGEMENT FOR INDIRECTLY ASCERTAINING THE ROTARY SPEED OF A PERMANENT-MAGNET-STATOR D.C. MOTOR

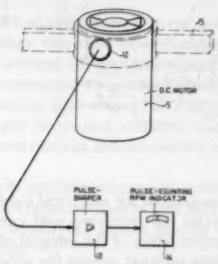
Adolf Mohr, Buehlertal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 8, 1977, Ser. No. 823,002

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1976, 2638954

Int. Cl.[2] G01R *31/02*; G01P *3/48*

U.S. Cl. 324—158 MG **11 Claims**



1. In a method of ascertaining the rotary speed of a D.C. motor, the D.C. motor comprising a permanent-magnet stator including a flux-return structure and at least one permanent-magnet stator magnet mounted on the flux return structure and an armature mounted for rotation within the stator and having a circumferential succession of armature teeth, the permanent-magnet stator magnet having leading and trailing end portions as considered in the direction of rotation of the motor armature, the method comprising ascertaining the rotary speed of the armature of the D.C. motor indirectly by sensing the variations in the stray flux of the motor at the exterior of the flux-return structure at a location adjacent the leading end of the stator magnet.

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PROGRAMMABLE PROBE FIXTURE AND METHOD OF CONNECTING UNITS UNDER TEST WITH TEST EQUIPMENT

Robert L. Beck, Wheeling, and Peter H. Goebel, Barrington, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 554,859, Mar. 3, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,212

Int. Cl.[2] G01R *31/02, 1/06, 15/12*

U.S. Cl. 324—158 F **41 Claims**

1. A connecting device for transmitting signals between a unit under test and an electrical interface comprising

cylinder means,

piston means reciprocably mounted within the cylinder closing one end of the cylinder,

means closing the other end of the cylinder,

the cylinder means, piston means and closing means defining an expandable chamber,

means for sealing the chamber,

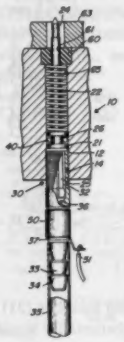
means for introducing a fluid at a predetermined pressure into the chamber,

the piston means being movable in one direction to a first position in response to a first predetermined pressure in the chamber and in the other direction to a second position in response to a second predetermined pressure in the chamber,

means for limiting the axial movement of the piston means,

first conductive means mounted on the piston means and movable therewith into contact with the unit under test when the piston is in the second position and out of contact with the unit under test when the piston is in the first position,

second conductive means electrically coupled to the first conductive means forming therewith a continuous conductive path providing a conduit for the passage of electrical signals, the second conductive means adaptable for connection with the electrical interface, and



a first stem portion of reduced diameter depending from the piston means into the expandable chamber slidably received by the closing means for guided movement in the expandable chamber

whereby signals are transmittable between the unit under test and the electrical interface when the piston is in the second position.

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ADAPTIVE PHASE DETECTION METHOD AND APPARATUS

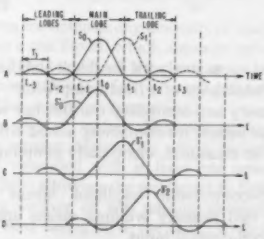
Dominique N. Godard, Le Rouret, and Andrzej T. Milewski, Saint-Jeannet, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,791

Claims priority, application France, Dec. 23, 1976, 76 39689

Int. Cl.[2] H04L *27/22*

U.S. Cl. 325—320 **12 Claims**



1. In a data transmission system using the PSK modulation technique wherein the phase of the signal transmitted at each of a sequence of signalling instants may be any one of the phases of a M- phase constellation, a phase detection method for determining an estimated value ϕ_n of the phase transmitted at signalling instant nT and for compensating for the effects of the intersymbol interference created by not more than one leading lobe of a subsequent signal and/or an arbitrary number N of trailing lobes of preceding signals, said interference being

caused by the impulse response of the transmission channel, said method comprising the steps of:

(a) determining the phase ψ_n of the signal received at each signalling instant nT,

(b) determining, for each signalling instant, at least two residual errors, each of which is obtained by subtracting from said received phase ψ_n, the value of one of the phases of the constellation combined with an estimated value of the phase error created by the intersymbol interference due to said preceding and said subsequent signals and corresponding to said one phase of the constellation,

(c) comparing said residual errors thus obtained with each other and determining the smaller,

(d) selecting as said transmitted phase ϕ_n, that phase of the constellation which yields said smaller residual error, and

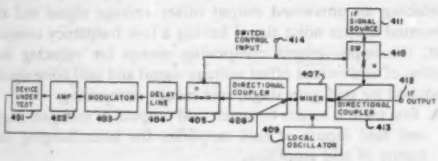
(e) selectively adjusting at least one of said estimated phase errors in accordance with the one of said determined residual errors related thereto.

4,138,645

WIDEBAND SIGNAL CALIBRATION SYSTEM

Vito J. Parato, Bay Shore, N.Y., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed May 31, 1977, Ser. No. 802,173
Int. Cl.² H04B *17/00*
U.S. Cl. 325—363 **11 Claims**



1. Apparatus for calibrating a superheterodyne receiver comprising:

(a) means for applying a first IF signal to the mixer of the receiver,

(b) means for extracting from the receiver an RF signal produced from said IF signal by the mixer, after said RF signal has passed through the RF components of said receiver,

(c) means for comparing said first IF signal with said extracted RF signal to determine the ratio of the two and thus provide an indication of the RF gain of the receiver,

(d) means for producing a representation of said RF gain and a representation of the calibration frequency at which said RF gain is measured,

(e) means for storing said representation,

(f) means for retrieving a stored gain representation by supplying to said means for storing, a representation of the calibration frequency at which said gain was measured, and

(g) means for adjusting the gain of the receiver adapted to receive said retrieved representation of gain and adjust the gain of the receiver in accordance with said retrieved gain representation to provide uniform receiver gain at all said calibration frequencies.

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WIDEBAND ABSOLUTE CALIBRATION SYSTEM

Vito J. Parato, Bay Shore, N.Y., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jun. 28, 1977, Ser. No. 810,890
Int. Cl.² H04B *17/00*
U.S. Cl. 325—363 **2 Claims**

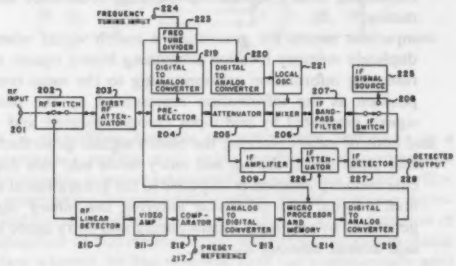
1. Apparatus for absolute calibration of a superheterodyne receiver of the type having an RF front end, a mixer, a local oscillator and an IF section, said front end being frequency selective and having a frequency range over which it will pass signals, comprising:

(a) means for applying an IF signal to the mixer of the receiver,

(b) means for extracting from said receiver a first RF signal produced from said IF signal by the mixer, after said first RF signal has passed through the RF front end of said receiver,

(c) means for comparing said IF signal with said extracted first RF signal to determine the ratio of the two and thus provide an indication of a first RF gain of the receiver,

(d) means for providing a second RF signal at a single frequency with a known absolute value of signal level and



applying said second RF signal to the RF port of said receiver,

(e) means for measuring the corresponding IF output of the receiver when said second RF signal is applied to the RF port of said receiver,

(f) means for comparing the level of the second RF signal with its corresponding IF output to determine a second gain which is the absolute gain of said receiver, and

(g) means for comparing the absolute gain with the first RF gain when the frequency of the first RF signal is the same as that of the second RF signal to determine a correction factor for adjustment of the first RF gain in order to convert said first RF gain to absolute gain over the entire RF frequency range of the receiver.

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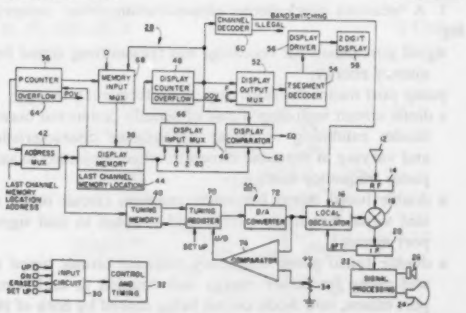
MEMORY TYPE TUNING SYSTEM FOR STORING INFORMATION FOR A LIMITED NUMBER OF PREFERRED TUNING POSITIONS

Charles M. Wine, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1977, Ser. No. 810,876
Int. Cl.² H03K *21/36*
U.S. Cl. 325—464 **7 Claims**



1. An apparatus for tuning a receiver to a predetermined number of preferred tuning positions less than the total number

of tuning positions available in a predetermined tuning range, comprising:

memory means including a number of memory locations equal to said preferred number of tuning positions for storing binary signals;

control means for selectively entering binary signals into one of said memory locations during an entry mode and retrieving binary signals from one of said memory locations during a retrieval mode;

input means for generating binary signals representing information corresponding to any one of said total number of tuning positions during said entry mode;

decoder means for locating an unused memory location containing binary signals representing nondesired information;

comparison means for generating a match signal when a duplicate memory location containing binary signals representing information corresponding to the same tuning position as the information represented by the binary signals generated by said input means is located; and

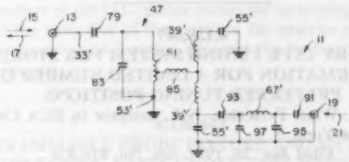
said control means entering the binary signals generated by said input means during said entry mode into said duplicate memory location in response to the generation of said match signal and otherwise entering the binary signal generated by said input means during said entry mode into said unused memory location.

4,138,648

BALANCED SYNCHRONOUS PARAMETRIC AMPLIFIER

Thomas Hudspeth, Malibu, and Harmon H. Keeling, Kernville, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 3, 1978, Ser. No. 892,532
Int. Cl.[2] H03F *7/00*
U.S. Cl. 330—4.9 **7 Claims**



1. A balanced synchronous parametric amplifier, comprising:

signal port means for receiving and transmitting signal frequency energy;

pump port means for receiving pump frequency energy;

a diode circuit including a pair of serially connected biased diodes exhibiting nonlinear capacitance characteristics and varying in the same direction when subjected to said pump frequency energy;

a double tuned signal frequency resonant circuit tuned to said signal frequency energy and coupled to said signal port means;

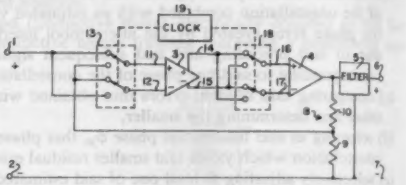
a double tuned pump frequency resonant circuit tuned to said pump frequency energy and coupled to said pump port means, said diode circuit being shared by both of the double tuned resonant circuits, said diodes being effectively in parallel in said double tuned signal frequency resonant circuit and in series in said double tuned pump frequency resonant circuit.

4,138,649

AMPLIFIER SYSTEM

Gregory L. Schaffer, Del Mar, Calif., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 25, 1977, Ser. No. 781,151
Int. Cl.[2] H03F *1/02*
U.S. Cl. 330—9 **15 Claims**



1. In an operational amplifier system including an amplifier having a pair of inputs and at least one output, a gain stage having a pair of inputs and a pair of outputs operatively connected to said inputs of said amplifier, and a feedback circuit connected between said output of said amplifier and one of the inputs of said gain stage, said operational amplifier system producing at said output of said amplifier an output signal proportional to the difference between the signals applied to said two inputs of said gain stage, said amplifier system also producing an unwanted output offset voltage signal and an unwanted output noise signal having a low frequency component, the improvement comprising means for reducing the portion of said output offset voltage signal and said noise signal produced by said gain stage, said means comprising

A. first switch means between said outputs of said gain stage and said inputs of said amplifier for interchanging the inputs of said amplifier,

B. second switch means for interchanging the inputs of said gain stage, and

C. clock means for synchronously operating said first switch means and said second switch means at a predetermined clocking frequency thereby maintaining the relative phasing of the signal applied to the two inputs of said gain stage and the output signal across the inputs of said amplifier and periodically reversing the polarity of the gain stage portion of the offset voltage signal and the gain stage portion of the low frequency component of the noise signal for equal periods.

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PHASE LOCK LOOP

Scott K. Anderson, 872 E. 400 North, Orem, Utah 84057

Division of Ser. No. 595,100, Jul. 11, 1975, Pat. No. 4,013,840, and a continuation-in-part of Ser. No. 253,265, May 15, 1972, abandoned, and a continuation-in-part of Ser. No. 492,397, Jul. 29, 1974, abandoned, and a continuation-in-part of Ser. No. 601,363, Aug. 4, 1975, Pat. No. 4,020,289. This application Mar. 21, 1977, Ser. No. 779,609
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—1 A **3 Claims**

1. A frequency and phase locking circuit comprising:

a voltage tuned oscillator (VTO) having an output and an input;

a variable modulus counter (VMC) conductively connected to receive the output of said VTO as its first input, and having an output and a second input;

a first node conductively connected to said VMC output;

signal position detector means having a first input which is conductively connected to said first node to receive said VMC output, a second input and an output;

a reference window generator having an output conductively connected to said second input of said signal position detector means;

a reset generator conductively connected to receive the

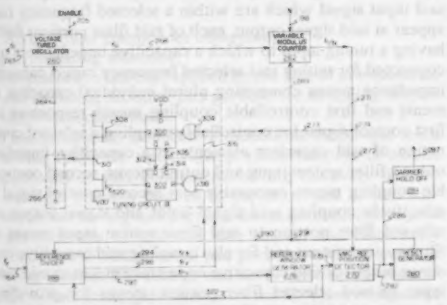
output of said signal position detector means as its input and supply as its output a reset signal;

a second node conductively connected to the output of said reset generator and to said second input of said VMC to supply said reset signal thereto;

a reference divider having a first input conductively connected to an external reference sifgnal and having a second input conductively connected to said second node to receive said reset signal, having a first output conductively connected to said reference window generator to supply a reference signal thereto, and having second and third outputs;

a tuning circuit having a first input conductively connected to said first node to receive said VMC output, a second input conductively connected to said reference divider to receive said second output of said reference divider and a third input conductively connected to said reference divider to receive said third output of said reference divider, and having an output conductively connected to said input of said VTO to supply a tuning signal thereto; and

wherein said reference divider supplies a reference signal to said reference window generator which generates a reference window signal of short duration and supplies it to



said signal position detector means, and wherein said VMC receives the output of said VTO and supplies an output which is the quotient of said VTO output divided by an integer, said signal position detection means receiving said VMC output and comparing it with said window signal and sending an output signal which causes said reset generator to supply a reset signal when said VMC output does not occur in time within said window signal, said reset signal resetting said VMC and reference divider to start sending their output signals approximately simultaneously, and wherein said tuning circuit compares in time the arrival of said VMC output with the arrival of the reference signal of said second output of said reference divider and the portion of the reference signal of said third output of said reference divider which is subsequent in time to said second output reference signal to generate a tune up in frequency signal when said VMC output arrives after said second output reference signal and before said third output reference signal and to generate a tune down in frequency signal when said VMC output arrives after said third output reference signal and before said second output reference signal, said tune up and tune down signals being supplied to said VTO input to tune up and tune down, respectively, the frequency of said VTO output.

4,138,651

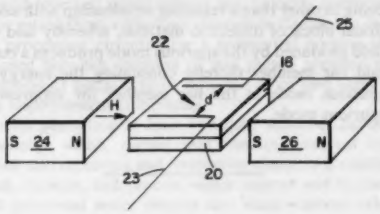
MULTIPLE MAGNETIC LAYER COMPOSITE FOR MAGNETOSTATIC SURFACE WAVE PROPAGATION

Wayne L. Bongianni, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 6, 1977, Ser. No. 831,040

Int. Cl.[2] **H03H** *9/30;* **H01P** *9/00;* **H01L** *43/10*

U.S. Cl. 333—30 R **6 Claims**



1. A monolithic multiple magnetic layer composite in a magnetostatic surface wave delay line having a bias magnetic field intensity oriented substantially parallel to a planar surface for propagating magnetostatic surface waves on said composite and oriented substantially perpendicular to the direction of propagation of said magnetostatic surface waves on said planar surface wherein the bias magnetic field has a substantially zero gradient in a direction perpendicular to said planar surface throughout the region of said delay line occupied by said composite, said composite comprising:

a substrate of magnetic-wave-inactive material having first and second opposing faces and a substantially uniform thickness between said first and second faces;

a first layer of a first magnetic-wave-active material deposited on said first face of said substrate wherein said first magnetic-wave-active material has a first preselected internal magnetization; and

a second layer of a second magnetic-wave-active material deposited on said second face of said substrate wherein said second magnetic-wave-active material has a second internal magnetization having a preselected difference from said first internal magnetization.

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DIELECTRIC RESONATOR CAPABLE OF SUPPRESSING SPURIOUS MODE

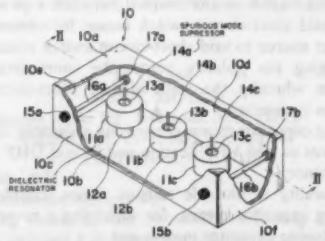
Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa, and Sadahiro Tamura, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed May 17, 1977, Ser. No. 797,857

Claims priority, application Japan, May 24, 1976, 51/66657[U]

Int. Cl.[2] **H01P** *1/16, 7/00*

U.S. Cl. 333—82 R **6 Claims**



1. A dielectric resonator for suppressing spurious modes comprising:

a cylindrical block of dielectric material having flat surfaces on the ends thereof; and

at least one straight, thin, electrically conducting bar member provided approximately in alignment with the axis of said cylindrical block of dielectric material and approximately in alignment with the direction of the electric field produced by propagation of a spurious mode in said cylindrical block of dielectric material and said bar member being in other than a retaining relationship with said cylindrical block of dielectric material, whereby said electric field produced by the spurious mode produces a current in said bar member thereby consuming the energy of the spurious mode in the bar member for suppressing the spurious mode.

4,138,653

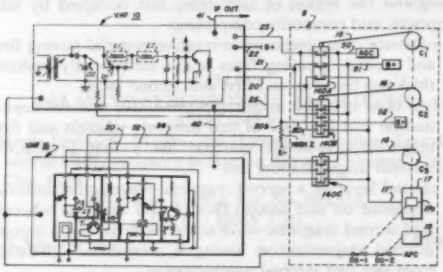
SOLID STATE TUNER CONTROL

Edward L. Midgley, Carol Stream, Ill., assignor to Stamcomp, Inc., Elk Grove Village, Ill.

Division of Ser. No. 133,265, Apr. 12, 1971, which is a continuation-in-part of Ser. No. 839,163, Jul. 7, 1969, Pat. No. 3,601,703. This application Aug. 31, 1972, Ser. No. 285,229

Int. Cl.[2] H03H *5/12*; H03J *3/06, 5/04*

U.S. Cl. 334—15 **3 Claims**



1. A multi-channel tuner including a VHF section and a UHF section, said tuner comprising:

a. first switch means for switching power to either said VHF or UHF section of said tuner;

b. said VHF section having a high frequency band and a low frequency band and said VHF section including a VHF coil having a first portion which is short-circuited when said VHF section is operating in said high frequency band;

c. short-circuit switch means connected in parallel with said first portion of said VHF coil for short-circuiting said first portion when said VHF section is operating in said high frequency band;

d. second switch means coupled between a power source and said short-circuit switch means for connecting said power source to said short-circuit switch means thereby changing the polarity across the short-circuit switch means whereby the state of said short-circuit switch means is reversed;

e. tuning capacitor means comprising a variable capacitance element in said VHF section and in said UHF section of said tuner;

f. a plurality of variable resistor means, coupled to said tuning capacitor means, for supplying a reverse bias to said tuning capacitor means; and

g. third switch means for coupling only one of said plurality of variable resistor means to said variable capacitor means at a time, wherein said first, second and third switch means have a common operating shaft.

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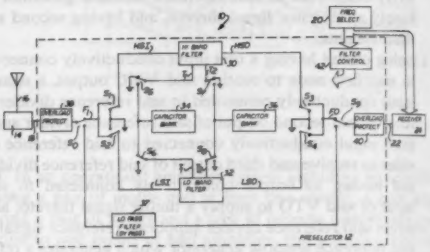
DIGITALLY TUNED CIRCUIT INCLUDING SWITCHING OF BANK CAPACITORS BETWEEN PLURAL TUNED CIRCUITS

Gabriel J. Luhowy, Lima, N.Y., assignor to Harris Corporation, Cleveland, Ohio

Filed Sep. 12, 1977, Ser. No. 832,680

Int. Cl.[2] H03J *5/14, 5/18*

U.S. Cl. 334—55 **8 Claims**



1. An electrically tunable filter system comprising at least two filter portions having signal inputs and signal outputs and adapted to respond to an input signal supplied at said signal input for filtering said signal so that only those components of said input signal which are within a selected frequency range appear at said signal output, each of said filter portions further having a tuning input to which a capacitive impedance is to be connected for setting said selected frequency range; capacitive impedance means comprising plural individual capacitor elements and first controllable coupling means responsive to a first control signal for controllably coupling a selected combination of said capacitor elements to a capacitive impedance output; filter system input and output means; second controllable coupling means responsive to a second control signal for selectively coupling said signal input and signal output of a selected filter portion to said filter system input means and filter system output and for also coupling said capacitive impedance output of said capacitive impedance means to said tuning input of said selected filter portion; means for providing a frequency selection signal indicative of a selected frequency range; and, filter control means responsive to said frequency selection signal for providing said first and second control signals in accordance therewith so as to couple a selected combination of said capacitor elements to said capacitive impedance output, and so as to further couple a selected filter portion to said system input and output, and said capacitive impedance means to said tuning input of said selected filter portion whereby said selected frequency range of said filter system is automatically set into said filter system in accordance with said frequency selection signal.

4,138,655

HIGH TEMPERATURE SENSOR

Masamitsu Nakano, Yokohama, and Iwao Inoue, Chiba, both of Japan, assignors to Niles Parts Co., Ltd. and Nihon Dennetsu Co., Ltd., both of, Japan

Filed Dec. 19, 1977, Ser. No. 862,150

Claims priority, application Japan, Aug. 6, 1977, 52-094805

Int. Cl.[2] H01C *7/00*

U.S. Cl. 338—30 **3 Claims**

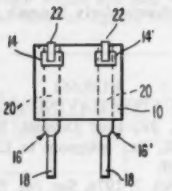
1. A high temperature sensor providing a case forming one electrical terminal, a metal fluoride composition filled in said

case and having a conductive or a non-conductive state in accordance with melting or solidifying of said metal fluoride composition at a predetermined temperature respectively, a conductive rod inserted into said metal fluoride composition and forming the other electrical terminal, said high temperature sensor comprising grained magnesium oxide mixed with said metal fluoride composition.

4,138,656
ATTACHMENT OF LEADS TO ELECTRICAL COMPONENTS

Leon Resnicow, Devon, Pa., assignor to Vishay Intertechnology, Inc., Malvern, Pa.

Filed Nov. 15, 1976, Ser. No. 742,030
Int. Cl.[2] H01C 1/14
U.S. Cl. 338—322 **7 Claims**

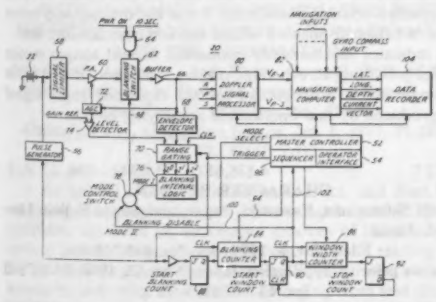


1. An electrical component comprising:
(a) an insulating substrate,
(b) a conductive material applied to one side of said substrate and including terminal pad portions for attaching electrically connecting leads,
(c) and electrically connecting monolithic leads, said leads having relatively thick rigid portions adapted to extend externally of said component, having relatively thinner, less rigid portions bonded to the other side of said substrate, and having end portions dressed around the edge of said substrate to said one side thereof and electrically connected to said terminal pad portions, said end portions being substantially thinner and narrower than the remainder of said less rigid portions to render them compatible for attachment to said terminal pad portions by welding.

4,138,657
SHIPBOARD APPARATUS FOR MEASURING OCEAN CURRENTS

David G. Shave, Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Oct. 25, 1977, Ser. No. 844,995
Int. Cl.[2] G01S 9/66
U.S. Cl. 340—3 D **14 Claims**

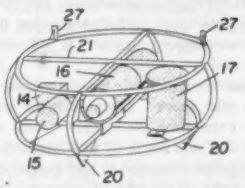


1. In a multiple-sensor navigation system mounted on a ship for determining the ship's track over or through a body of water, said navigation system including a navigation computer interconnected with said sensors, at least two of the sensors being a device to measure the ship's true heading and a pulsed doppler sonar set which includes as some of its components a two-axis transducer for directing a pulsed acoustic signal towards a water bottom and for receiving signal returns reflected from both water-mass discontinuities in said body of water and from the water bottom, signal receiving and processing circuitry interconnected with said transducer for resolving said received signal returns into velocity components, means for establishing a blanking interval to disable the receiving and processing circuitry for a substantial portion of the time elapsed between emission of said pulsed acoustic signal and reception of signal returns reflected from said water bottom, the improvement comprising:
means for providing at least one time window, having an adjustable width, during said blanking interval during which said receiving and processing circuitry is enabled to track, receive, and process water returns and to convert said processed water returns into water-current velocity components; and
means for adjusting the width of said time window.

4,138,658
RECORDING OCEAN BOTTOM DEVICE, SUCH AS A SEISMOGRAPH

Felix Avedik, Locmaria Plouzane, and Vincent Renard, Lanildut, both of France, assignors to Etablissement Public dit "Centre National pour l'Exploitation des Oceans", Paris, France

Filed May 31, 1977, Ser. No. 801,864
Claims priority, application France, Jun. 4, 1976, 76 17642
Int. Cl.[2] G01V 1/38
U.S. Cl. 340—7 R **17 Claims**



1. A pick-up, such as a seismograph, intended to be used at the bottom of the sea, comprising a detector, a frame provided with a detachable ballast, a sealed, water-tight container mounted on the frame and floats for bringing the remainder of the pick-up to the surface when the ballast is detached, the frame including a means for supporting the detector outside the container and by which the detector may be loosened from the frame and deposited on the sea bed, the said detector being connected to the container by means of an electric transmission cable and mooring cable, the container containing an electrical feed source and recording means for recording signals delivered by the detector.

4,138,659
SONIC MOTOR

Sven J. Johnson, Main Rd., Southold, N.Y. 11971

Filed Apr. 1, 1977, Ser. No. 783,645
Int. Cl.[2] H04B 13/00, 11/00
U.S. Cl. 340—8 R **17 Claims**

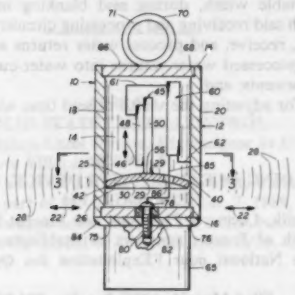
1. A sonic motor comprising:
a. housing means having an axially extending cylindrical cavity defining a diameter therein,
b. a transmission member having spaced apart surfaces with an output end the diameter of which substantially conforms with the diameter of said cavity,
c. coupling means connecting said transmission member to

said housing means so as to maintain said output end of said transmission member in energy transmitting relationship to said housing means,

d. transducer means connected to one of said surfaces on said transmission member at a loop of longitudinal mechanical vibration, and substantially centrally thereof to provide longitudinal mechanical vibrations so as to cause said transmission member to vibrate in a radial mode such that said housing means in the area of said coupling means is radially vibrated,

e. said transducer means includes:

(i) an elongated support member having one end thereof connected to said transmission member, and



(ii) a piezoelectric element mechanically joined to said support member and adapted to be longitudinally vibrated in a plane substantially normal to said transmission member so as to obtain mechanical vibration of said support member longitudinally thereof so as to transmit said vibrations to said transmission member such that said transmission member is vibrated in said radial mode, and

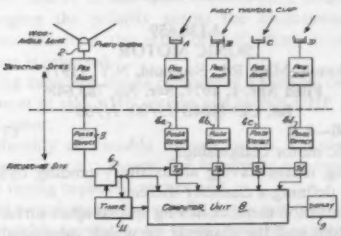
f. said transmission member having a concave configuration between said spaced apart surfaces with said concave surfaces extending outwardly from said transmission member, and said angle of said concave surfaces adapted to obtain radial vibration at said output end at a frequency related to the frequency of vibration generated by said transducer means.

4,138,660

AUTOMATED FLASH-BANG METHOD AND APPARATUS FOR DETERMINING LIGHTNING STROKE DISTANCES

Robert D. Hill, Montecito, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1977, Ser. No. 833,325
Int. Cl.[2] G01S *5/18*
U.S. Cl. 340—16 R **7 Claims**



1. A flash-bang method of determining the ground plane distance of a lightning event from a selected ground station comprising:

detecting a lightning flash event received at a location near said selected station,

locating at least four sound-detecting stations in a rectangular arrangement of known dimensions disposed near said selected station,

detecting thunder sound events received at each of said sound-detecting stations,

measuring the time difference between receipt of the lightning event and receipt of the sound event for each sound-receiving station,

deriving from said time difference measurements the slant range distance values of each sound-receiving station, and

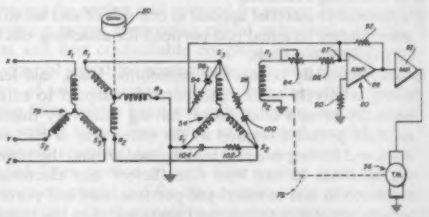
deriving said ground plane distance by employing said slant range values and said known rectangular dimensions to determine the horizontal distance value of a particular sound-receiving station from a particular point located on the ground perpendicularly beneath said lightning flash event.

4,138,661

ATTITUDE INDICATOR HAVING EXPANDED SCALE

Hugh P. McAdams, Jr., Port Deposit, Md., and Ronald J. Balog, Drexel Hill, Pa., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 7, 1976, Ser. No. 730,029
Int. Cl.[2] G08C *19/48*
U.S. Cl. 340—27 AT **7 Claims**



1. A servomechanism for an attitude indicator, comprising:

a synchro-control transformer having stator windings for receiving an input angle signal and a rotor winding for producing an output signal;

an operational amplifying circuit connected to sum said input angle signal and said control transformer output signal to produce an expanded angle signal;

a torque motor;

a servo-amplifier connected between said operational amplifying circuit and said torque motor to apply said expanded angle signal to said torque motor;

a mechanical connection from said torque motor to said synchro-control transformer rotor for driving said rotor to a balanced position within the servomechanism; and

an indicator mechanically connected to said torque motor for providing an expanded display indication of said input angle signal proportional to said expanded angle signal produced by said operational amplifying circuit.

4,138,662

CHARACTER READER

Atsushi Shimoyama, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

Filed Nov. 8, 1977, Ser. No. 849,705
Claims priority, application Japan, Nov. 15, 1976, 51-137143
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 MA **8 Claims**

1. A character reader for reading at least one of either characters or patterns from a document comprising:

a scanner means for scanning said document on a line by line

basis producing an output signal bearing a relationship to said document;

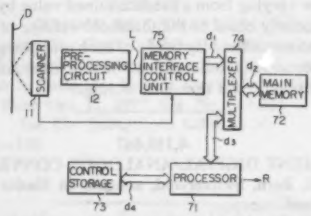
a pre-processing means for receiving said scanner output signal and for producing quantized video signals bearing a relationship to said scanner output signal;

a main memory means comprising a flag byte area and a video byte area for storing said quantized video signals from said pre-processor means;

a processor means for receiving said quantized video signals from said main memory means and for processing and recognizing said quantized video signals, said processor means controlled by control programs transmitted to said processor means from a control storage means;

a multiplexer means connected between said preprocessor means and said main memory means and further connected between said main memory means and said processor means for routing said quantized video signals;

a memory interface control unit means connected between said pre-processor means and said multiplexer means for controlling the flow of signals from said pre-processor



means to said multiplexer means and for producing a plurality of video signal units from the quantized video signals of said pre-processing means, each of said video signal units corresponding to a signal scanning line scanned by said scanner means and comprising a plurality of bytes, said video signal units stored in said video byte area of said main memory;

said memory interface control unit means generating a plurality of units of control information, each unit of control information corresponding to one of said video signal units, the coding of each unit of control information dependent upon the coding of its respective video signal unit, and said control information units stored in said flag byte area of said main memory;

wherein each of said video signal units is supplied to said processor means with its respective control information unit and said processor means processes and recognizes each video signal unit sequentially with said respective control information unit being processed by said processor means to provide control instructions to said processor means.

4,138,663

OPTICAL READER FOR INFORMATION DISCS EQUIPPED WITH MEANS FOR AUTOMATIC ACCESS TO THE INFORMATION

Jean-Claude Lehureau, and Pierre Oprandi, both of Paris, France, assignors to Thomson-Brandt, Paris, France

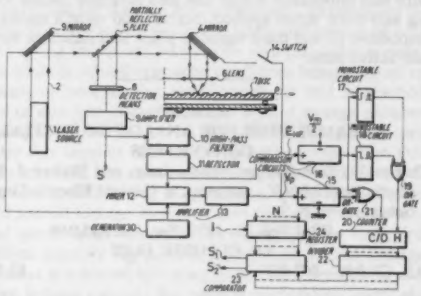
Filed Jun. 27, 1978, Ser. No. 919,552

Claims priority, application France, Jul. 1, 1977, 77 20373

Int. Cl.[2] G11B *7/00*

U.S. Cl. 340—146.3 F **7 Claims**

1. An optical reader for information discs, said discs being recorded along a track with information locatable by their addresses recorded on successive grooves of the track, said optical reader comprising a radiation source, a reading head for projecting on said disc an optical reading spot, detecting means for detecting the radiation emerging from said disc and delivering a reading signal and an error signal characteristic of amplitude and direction of the radial difference between the position of the reading spot and the position of the nearest groove of said track from said spot, means for automatic access to the information, said means comprising a radial advance mechanism to control relative radial movement of the optical reading head and the disc, an up-and-down counting device for counting the grooves traversed during said radial movement, said counting device receving simultaneously said reading signal and said radial error signal, and a comparison circuit



receiving the content of said up-and-down counting device and a predetermined value corresponding to the position of the required information, said comparison circuit being connected to said radial advance mechanism and delivering a control signal to control actuating and stopping of said advance mechanism.

4,138,664

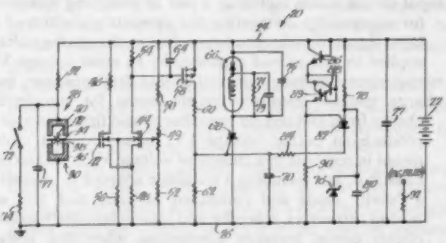
WARNING DEVICE

Frederick J. Conforti, Aurora; Richard J. Schwarzbach, Naperville, and Quentin L. Schneider, Bensenville, all of Ill., assignors to Pittway Corporation, Northbrook, Ill.

Filed Dec. 14, 1976, Ser. No. 751,021

Int. Cl.[2] G08B *17/10*

U.S. Cl. 340—507 **12 Claims**



1. An improved warning device comprising means for detecting the presence of predetermined phenomena and for generating a first signal which changes to a predetermined value upon the presence of said phenomena in predetermined concentrations; indicator means having an active and an inactive state; integrated circuit means formed on a single substrate and connected with said detecting means and said indicator means and responsive to said detecting means to place said indicating means in said active state, said integrated circuit means including means for generating a reference potential, a differential amplifier including first and second field-effect transistors (FETs), said first FET connected at a gate electrode thereof directly with said detecting means for receiving said first signal, said second FET connected at a gate electrode thereof with said reference potential, said first FET connected with said second FET to control the conductivity between drain and source electrodes thereof in accordance with the value of said first signal, said drain-source circuit of said second FET providing a second signal, and second circuit means

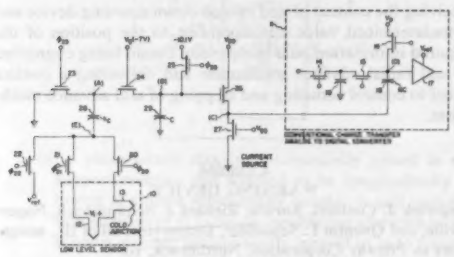
including a third FET connected at a gate electrode thereof with said drain-source circuit of said second FET for having the conductivity between drain and source electrodes thereof controlled by the conductivity of said second FET, and impedance means connected in series circuit with the drain-source circuit of said third FET for developing a third signal thereacross, said third signal having a value in accordance with the conductivity of said third FET; and switch means connected with said impedance means and said indicator means for having said third signal applied thereto, said switch means being responsive to said third signal to place said indicator means in said active state.

4,138,665

PREAMPLIFIER FOR ANALOG TO DIGITAL CONVERTERS

Charles W. Eichelberger, Schenectady, and Walter J. Butler, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,068
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 NT **13 Claims**



1. An amplifier circuit comprising, in combination:
a first capacitor having a capacitance C;
a second capacitor having a capacitance kC;
input circuit means including a pair of switching transistors for sequentially connecting the opposite polarities of an input signal to said second capacitor to change the voltage applied to said second capacitor by an input voltage V_i;
output circuit means connected to said first capacitor; and
charge transfer transistor circuit means for transferring charge from said second capacitor to said first capacitor to produce an output voltage kV_i on said output circuit means in response to a change of voltage V_i on said second capacitor, and including a transistor adapted to operate in a "shelf" mode and connected between said first and second capacitors, whereby said charge transfer transistor circuit means becomes conducting when the voltage across said second capacitor changes by V_i to transfer a charge packet having a magnitude $q_i=kCV_i$ to said first capacitor to increase the voltage across said first capacitor by kV_i.

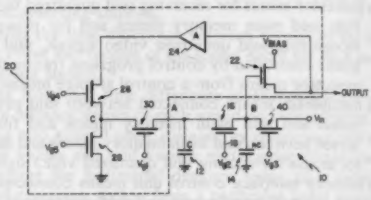
4,138,666

CHARGE TRANSFER CIRCUIT WITH THRESHOLD VOLTAGE COMPENSATING MEANS

Charles W. Eichelberger, Schenectady, and Walter J. Butler, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,233
Int. Cl.[2] H03K *13/09*
U.S. Cl. 340—347 CC **10 Claims**

1. A charge transfer circuit comprising:
first and second charge storage capacitors;
charge transfer circuit means, including a MOSFET coupled between said first and second charge storage capacitors, for transferring a discrete charge packet from said first to said second capacitor during each of a plurality of charge transfer operations, the magnitude of each said charge packet being a function of the magnitude of the voltage across said first capacitor just prior to each charge transfer operation and the magnitude of the threshold voltage of said MOSFET;
feedback circuit means for recharging said first capacitor



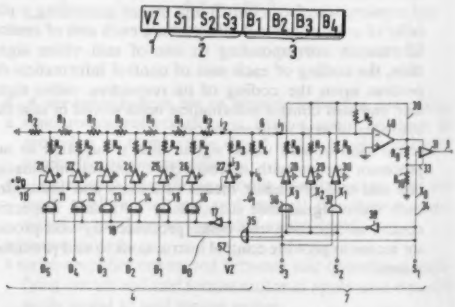
after each said charge transfer operation, the level to which said feedback circuit means charges said first capacitor varying from a predetermined value by an amount substantially equal to the threshold voltage of said MOSFET to cause the magnitude of each said charge packet to be substantially independent of any fluctuations in the magnitude of said threshold voltage.

4,138,667

SEGMENT DIGITAL/ANALOGUE CONVERTER

Paul Vogel, Bern, Switzerland, assignor to Hasler AG, Bern, Switzerland

Filed May 16, 1977, Ser. No. 797,189
Claims priority, application Switzerland, May 17, 1976, 6119/76; Jun. 2, 1976, 6903/76
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 DA **1 Claim**



1. A segment digital/analogue converter for conversion of an eight-bit PCM-word into an analogue output voltage in accordance with the CCITT A-law, with a weighting network including a resistor chain and a stepwise switched operational amplifier, with inputs for connection of each bit of said PCM-word with said weighting network and said amplifier via digital gates and low-impedance switches and with a control line for controlling the sign of said output voltage in accordance with the sign-bit of the PCM-word, comprising
an electrical connection to ground of the one end of the weighting network's resistor chain,
an electrical connection of the other end of the resistor chain, to the first input of an operational amplifier, and connection of the second input of the amplifier to ground;
a source of negative reference voltage ($-U_1$);
a first resistor (R_4) connecting the output (6) of the weighting network to said source of negative reference voltage ($-U_1$), the value of said first resistor (R_4) being such to give rise of a current (i_4) being equal in value to

the maximum possible output current of said weighting network;

a second resistor (R_3) connecting the output (6) of said weighting network to a first low-impedance switch (27), which is controlled by the sign-bit (VZ) of said PCM-word and which switches said second resistor (R_3) either to ground or to a positive reference voltage ($+U_o$), the value of said second resistor also being such to give rise of a current (I_3) being equal in value to the maximum possible output current of said weighting network;

a voltage divider (R_9, R_{10}) having a resistance ratio of 15:1, and an intermediate tap (33), connecting the output (39) of the operational amplifier (40) to ground; and

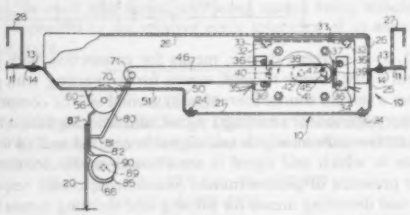
a second low-impedance switch (31) which is controlled by the most significant bit (S_1) of said PCM-word and which is connected to connect either the output (39) of the operational amplifier (40) or the tap (33) of said voltage divider (R_9, R_{10}) to the output (9) of the segment digital/analogue converter.

4,138,668

SCHOOL BUS STOP SIGN

Joseph E. Latta, Jr., Orange High Rd., Hillsborough, N.C. 27278, and Virgil M. Stafford, High Point, N.C., assignors to said Joseph E. Latta, Jr., by said Virgil M. Stafford

Filed Oct. 12, 1977, Ser. No. 841,358
Int. Cl.[2] B60Q *1/46;* G08B *5/26*
U.S. Cl. 340—130 **4 Claims**



I. A stop sign apparatus for a school bus, comprising in combination:

(a) a housing having an outer wall, a base wall opposing said outer wall, opposing end walls and opposing sidewalls, said walls being rectangular in shape and integrally joined to provide a substantially rectangular box-like internal housing cavity, said outer wall having a first rectangular opening therein adjacent the normally rearwardly disposed end of said housing, a cover detachably secured thereto and having a second rectangular opening adjacent the normally forwardly disposed end of said outer wall and means enabling said housing to be rigidly secured to an exterior school bus sidewall with said base and outer walls vertically positioned;

(b) a reversible DC gear motor mounted within said housing opposite said first opening and having a base portion rigidly secured to said base wall, an output shaft, an arm mounted at one end on said output shaft and rotatable within said cavity and a stub shaft axially oriented parallel to said output shaft and mounted on and extending outwardly from an opposite end of said arm;

(c) a connecting rod arranged for longitudinal reciprocal movement within said housing and pivotally secured at one driven end to said stub shaft for being driven thereby and having an opposite drive end;

(d) a sign mounting and spring-loaded linkage arrangement including a first linkage member having a pivotal mount on said housing with one end thereof extending into said housing and pivotally connected to said connecting rod drive end and an opposite unattached end thereof extending outwardly through said second opening and pivotal about an axis parallel to said stub shaft axis and located externally of said housing proximate said second opening, a second linkage member having one inner end pivotally mounted on said housing and an opposite outer sign support end extending therefrom, said second linkage member being pivotal about an axis parallel to the axis about which said first linkage member pivots, first spring means arranged to releasably force a rearwardly facing, outwardly disposed surface portion of said second linkage member in contacting drive relation with said unattached end of said first linkage member enabling said second linkage member the freedom in abnormal operating conditions of being forced forward against the tension of said first spring means and away from said first linkage member while in normal operating conditions being adapted to remain in loose driving contact with the said unattached end of said first linkage member, a third linkage member having a pivotal mount on said second linkage member outer sign support end and pivotal thereon about an axis parallel to the axis about which said second linkage member rotates and having a leg portion arranged to engage said second linkage member outer sign support end, second spring means arranged to releasably force said third linkage member leg portion against said second linkage member in a normal operating position while enabling said third linkage member leg portion the freedom under abnormal conditions to pivot away from said second linkage portion;

(e) a sign member with warning lights mounted thereon and having an inner edge portion secured to said third linkage member leg portion and adapted to being normally pivoted by said sign mounting and linkage arrangement between a retracted position in which it extends rearwardly and parallel to said bus sidewall and a deployed position in which it extends outwardly and perpendicular to said bus sidewall and when in said deployed position being swingable with said third linkage member leg portion either rearwardly about the axis about which said third linkage member pivots or forwardly about the axis about which said second linkage member pivots;

(f) first and second normally closed limit switches mounted in opposed positions proximate and in the path of rotation of said arm, said first switch being arranged to be contacted by said arm when said sign is in said deployed position and said second switch being arranged to be contacted by said arm when said sign is in said retracted position;

(g) a manual electric control switch within said bus in a position accessible to the driver of said bus, said switch having a deploy and retract position corresponding to deployment and retraction of said sign member;

(h) first circuit means including connecting wiring enabling said gear motor to be connected to the bus battery through said second limit switch in a first circuit configuration when said control switch is in one position preparatory to sign deployment when the bus is stopped and in which first circuit configuration said arm, connecting rod and linkage arrangement is actuated by said gear motor shaft rotating in one direction to move said sign member to said deployed position whereupon said second limit switch is electrically opened by contact with said arm and said battery is disconnected from said gear motor and enabling said gear motor to be connected to the bus battery through said first limit switch in a second circuit configuration when said control switch is in another position preparatory to sign retraction when the bus is ready to move and in which said second circuit configuration said arm, connecting rod and linkage arrangement is actuated by said gear motor shaft rotating in an opposite direction to move said sign member to said retracted position whereupon said first limit switch is electrically opened by contact with said arm and said battery is disconnected from said gear motor; and

(i) second circuit means including a circuit interrupter, said first circuit means wiring being connected such that said sign warning lights are continuously energized by said

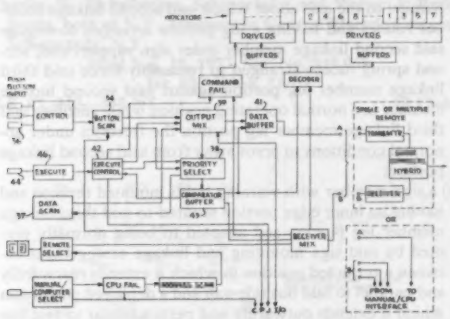
battery through said circuit interrupter and independent of the electrical position of said first and second limit switches and electrically flash when and so long as said control switch is in said one position.

4,138,669

REMOTE MONITORING AND CONTROLLING SYSTEM FOR SUBSEA OIL/GAS PRODUCTION EQUIPMENT

David M. Edison, Murrysville; Fred S. Marton, Monroeville, both of Pa., and John N. Ucovich, San Jose, Calif., assignors to Compagnie Francaise des Petroles "TOTAL", Paris, France

Filed May 3, 1974, Ser. No. 466,392
Int. Cl.[2] H04Q *9/00*; G05B *9/03*; G05D *7/00*; G06F *15/46*
U.S. Cl. 340—147 R **16 Claims**



1. In a system for the remote monitoring and controlling of functions of subsea oil/gas production equipment wherein a control station generates a plurality of coded signals for transmission to first and second remote stations for the monitoring and control of the production equipment, said control station comprising

selection means for selecting either the first or the second remote stations for the control of the production equipment, said first remote control station having dominant control with respect to said second remote control;

control means for generating an address and control digital signal for transmission to the selected remote station for a selected function thereat;

alarm level adjustment means for generating an alarm level digital signal for transmission to the selected remote station for selecting a predetermined alarm level for a predetermined function;

first multiplexing means coupled to said control and alarm means and operable for forming one of said coded signals from both said address and control signal and said alarm level signal and operable for multiplexing said plurality of coded signals for transmission to the selected remote station;

priority selection means operable to receive said one coded signal from said first multiplexing means for storing said one coded signal in accordance with a predetermined signal priority arrangement;

second multiplexing means for the selective demultiplexing of a received coded signal from the selected remote station to obtain a coded signal in a time slot allocated to said one coded signal;

comparator means operable for receiving and comparing said received coded signal in the time slot allocated to said one coded signal with said one signal and operable to produce a set signal for a match therebetween;

execute control means for generating an execute digital signal when said set signal and a predetermined signal are coupled therein;

coupling means for coupling said execute digital signal to said first multiplexer means for incorporation into said one coded signal for transmission; and

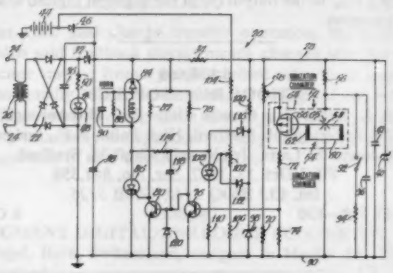
monitor means for providing monitoring information to said second remote station when said first remote station has been selected.

4,138,670

A.C. POWERED DETECTING DEVICE WITH BATTERY BACKUP

Quentin L. Schneider, Bensenville, and Richard J. Schwarzbach, Naperville, both of Ill., assignors to Pittway Corporation, Northbrook, Ill.

Filed Jan. 3, 1977, Ser. No. 756,494
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—507 **29 Claims**



1. In a warning device, means for connecting with power from a first source thereof; means for connecting with power from a second source thereof, said second source comprising a battery; means for emitting a signal, said emitting means having an active state in which said signal is emitted and an inactive state in which said signal is not emitted; means for detecting the presence of predetermined phenomena; means responsive to said detecting means for placing said emitting means in said active state; means for monitoring the output voltage of said battery and for placing said emitting means in said active state when said voltage equals a first predetermined value; and means for applying power from said first source thereof to said emitting means, said detecting means, said responsive means and said monitoring means, and for applying power thereto from said second source thereof upon interruption of power from said first source.

4,138,671

SELECTABLE TRIMMING CIRCUIT FOR USE WITH A DIGITAL TO ANALOG CONVERTER

Donald T. Comer, Los Gatos; Daniel J. Dooley, Saratoga, and John A. Schoeff, Los Gatos, all of Calif., assignors to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Feb. 14, 1977, Ser. No. 768,328
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 DA **15 Claims**

1. In a digital-to-analog signal converter comprising a plurality of stages each adapted to produce a predetermined output signal within a given tolerance range, and means responsive to an input digital signal for combining the outputs from selected ones of said stages to produce a converter output signal the magnitude of which is representative of the input binary signal, wherein the improvement comprises:

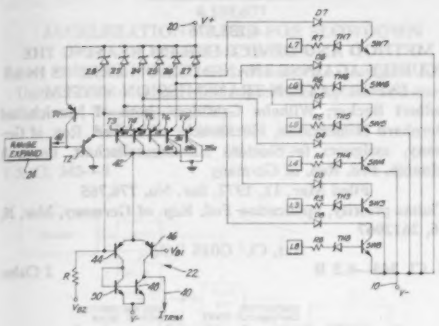
for each of at least some of said stages, a plurality of selectable transistor means external to said stage and adapted to be coupled with a voltage supply for producing a corrective trim signal, means for permanently selecting individual ones of said transistors for inclusion in the production of said trim signal irrespective of changes in the voltage supply, the pattern of selected transistors determining the magnitude of said trim signals, and means for combining

the stage signal with its respective trim signal to produce a corrected stage output signal,

means for establishing a common reference current, and

proportional current mirror means associated with each of said trim signal producing means,

each of said current mirror means mirroring a proportion of



said common reference current to provide an individual reference current for its associated trim signal producing means, the magnitude of said individual reference currents being in mutual non-binary relationship, and the proportion for each trim signal producing means being selected in proportion to the relative error tolerance of its associated stage.

4,138,672

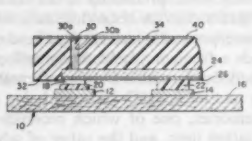
MEANS FOR CONNECTING A DISPLAY IN A CIRCUIT

Michael W. Kepchar, Stamford, Conn., assignor to General Time Corporation, Thomaston, Conn.

Filed Mar. 30, 1977, Ser. No. 782,907

Int. Cl.[2] G08B *5/36*

U.S. Cl. 340—378.1 **4 Claims**



1. A read-out device having capability of display of one or more of a plurality of alpha-numeric characters by means of electrical energization of selected ones of an array of light-emitting diodes, each diode providing a point source of light corresponding to a segment of each character when electrically energized, comprising a circuit board providing thereon said array of diodes, electrical circuit means supported on said circuit board adapted to be connected to a source of power whereby each said diode may be energized, means for passing light from each said diode which shall have been energized to a viewing surface thereby to provide a display formed of those segments required for each character, and wherein the improvement comprises connector means for electrically connecting each said diode in an electrical circuit, said connector means including a transparent element plate-like in form carried on and extending between at least one of said diodes and common terminal means of said electrical circuit means, said connector means having a continuous conductive metallic coating on one side thereby to contact each said diode and said common terminal means, and said light passing means maintaining said connector means in said position.

4,138,673

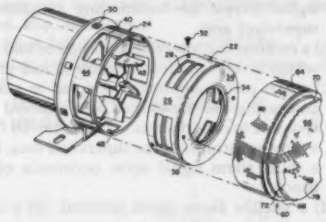
SMALL SIREN HAVING PROTECTIVE SCREEN

James H. Faust, Cicero, Ill., assignor to A B C Auto Alarms, Inc., Elk Grove Village, Ill.

Filed Oct. 11, 1977, Ser. No. 841,120

Int. Cl.[2] G10K *7/04*

U.S. Cl. 340—405 **16 Claims**



1. In a siren which includes a fractional horsepower motor, plate means for mounting the motor with a shaft protruding, a perforated and vaned rotor mounted on the shaft, a perforated cup-shaped stator coaxial with the shaft and rotor and having perforations around the circumference thereof and an axial opening whereby an intake orifice and plural exhaust windows are defined, air being drawn through the orifice, into the interior of the siren axially and discharged radially through the perforations; the invention comprising, a protective screen secured to the siren and having a face positioned over the intake of the stator, the face having a generally uniform mesh size of which being selected to have openings having a diameter greater than 0.050 and less than 0.250 inches to restrict air intake but enabling at most 70% of the intake air when unrestricted to pass through said face and a cylindrical flange portion surrounding the exhaust portion of the siren and being spaced from the exhaust openings thereof, the cylindrical flange being formed of a mesh of apertures of variable size and/or configuration.

4,138,674

FOUR WIRE MULTI-SATELLITE INTRUSION ALARM CONTROL SYSTEM WITH TAMPER SWITCH

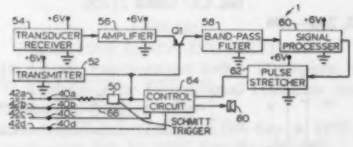
Peter E. Humphries, King, Canada, assignor to Contronic Controls Limited, Mississauga, Canada

Filed Feb. 22, 1977, Ser. No. 770,867

The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.

Int. Cl.[2] G08B *29/00*

U.S. Cl. 340—506 **9 Claims**



1. An intrusion alarm system comprising:

(1) a master control unit having:

(a) two power supply terminals and power supply means coupled thereto for supplying power to said power supply terminals,

(b) a master drive signal terminal, and a drive signal generator coupled thereto for applying a drive signal to said master drive signal terminal,

(c) a master alarm signal terminal, and intrusion alarm detector means coupled thereto and responsive to receipt of a predetermined first high level alarm signal thereat for generating an intrusion alarm,

(d) tamper alarm detector means coupled to said master alarm signal terminal and responsive to receipt thereat of a second high level alarm signal different from said first high level alarm signal for generating a tamper alarm,

(2) a plurality of satellite units, each having:

(a) a satellite drive signal terminal, and a transmitter coupled thereto and responsive to receipt of said drive signal thereat for transmitting a radiation field in a supervised area,

(b) a receiver for receiving a portion of said radiation field which is reflected from objects in said area,

(c) signal processing means coupled to said receiver for comparing the transmitted and received fields and responsive to disturbances in said received field caused by a moving intruder in the supervised area, for generating a third alarm signal upon occurence of such disturbance,

(d) a satellite alarm signal terminal, (e) a control circuit coupled to said signal processing means and to said satellite alarm signal terminal and responsive to receipt of said third alarm signal for generating said first high level alarm signal at said satellite alarm signal terminal,

(f) a housing, a cover removable from said housing for providing access to said housing, and a tamper switch within said housing and operable upon removal of said cover,

(g) said control circuit including tamper switch detector means connected to said tamper switch and to said satellite alarm signal terminal and responsive to operation of said tamper switch for generating said second high level alarm signal at said satellite alarm signal terminal,

(h) two satellite power receiving terminals for receiving power and coupled to said transmitter, and to said receiver, said signal processing means, and to said control circuit for supplying power thereto,

(3) a cable having only four wires connecting each satellite unit to said master control unit, two of said wires being connected between said power supply terminals and said satellite power receiving terminals, a third of said wires being connected between said master drive signal terminal and said satellite drive signal terminal, and the fourth of said wires being connected to said master alarm signal terminal and said satellite alarm signal terminal.

4,138,675

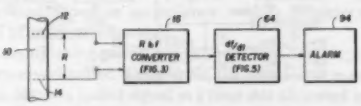
FREEZING POINT MONITORING SYSTEM FOR FRUIT TREES AND THE LIKE

William F. Eakin, Union Gap, Wash., assignor to Eakin Fruit Company, Union Gap, Wash.

Filed Apr. 4, 1977, Ser. No. 784,342

Int. Cl.² G08B 21/00

U.S. Cl. 340—596 **17 Claims**



1. The method of monitoring the freezing point in the tissue of fruit trees and other plants, comprising the steps of:

internally sensing the electrical resistance of a selected region of said tissue;

converting the electrical resistance sensed into another electrical quantity which is proportional to the electrical resistance sensed;

monitoring said electrical quantity and detecting a predetermined rate of change of the magnitude of said electrical quantity which is indicative of an abnormal step like increase in said electrical resistance; and

providing an output signal for purposes of activating an alarm or providing a control function in response to the detected predetermined rate of change.

4,138,676

METHOD AND DEVICE FOR INCREASING THE SECURITY AGAINST TRANSMISSION ERRORS IN AN INFORMATION TRANSMISSION SYSTEM

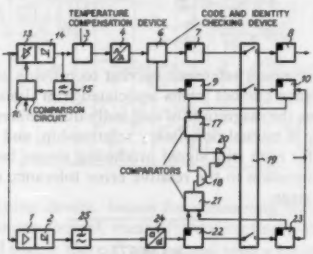
Friedbert Becker; Wilhelm Grafinger, both of Munich, and Bernhard Hildebrandt, Hochbruck, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 776,765

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612967

Int. Cl.² G01S 9/56

U.S. Cl. 343—6.5 R **2 Claims**



1. In a device, particularly for the railroad field, for increasing security with respect to transmission faults in an information-transmission system, in which an interrogation device and a passive response device are movable relative to one another, and in which the interrogation device transmits an interrogation signal which can be periodically swept through a predetermined frequency band, preferably in the microwave range; the said interrogation device receiving as a response signal, from the passive response device, during a read operation of at least two periods a frequency selectively reflected interrogation signal in accordance with a k-digit information item to be transmitted; the said interrogation device being provided with at least two memories, one of which receives the currently obtained information item, and the other of which receives a previously obtained information item; the said interrogation device being provided with a code and/or identity checking device, which after each period of the response signal assigns an error designation value showing how many of the digits are incorrect; the said code and/or identity checking device being connected with at least two memories, one of which receives the current error designation value, and the other of which receives the lowest previous error designation value; the said interrogation device being provided with a comparator which compares the current and the lowest previous error designation value and closes switching means, which transfers the content of the memory with the currently obtained information item to the memory for the previously obtained information item, if the current error designation value is lower than the lowest previous error designation value, the combination of means for determining the input level of low frequency portions lying below the sweep frequency of the interrogation signal of the response signal; means for comparing the input signal level of the currently received period of the response signal with the input signal level of the previously received period of the response signal, operative to deliver a first signal to said switching means if the input signal level of the currently received period is higher than the input signal level of the previously received signal; said comparator, comparing the

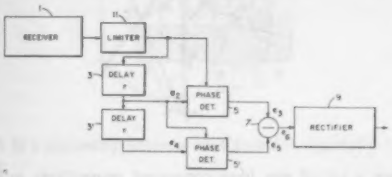
current and previous error designation values being operative to deliver a second signal to said switching means if both values are equal; closing of said switching means taking place in the simultaneous presence of both of said first and the second signals.

4,138,677

ACCELERATION FILTER FOR SLOWDOWN DISCRIMINATION

Robert O. Sinclair, Jr., Morris Plains, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 6, 1966, Ser. No. 519,164
Int. Cl.[2] G01S *9/44*
U.S. Cl. 343—8 **13 Claims**



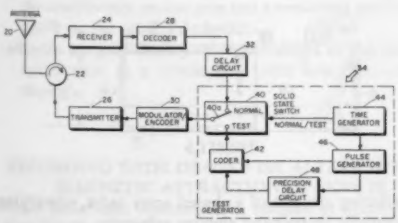
7. An acceleration filter comprising first and second delay circuits each having an input and an output; first and second phase detectors each having two inputs and an output; a source of signals connected to the input of said first delay circuit and to one input of said first phase detector; the output of said first delay circuit being connected to the other input of said first phase detector, one input of said second phase detector and to the input of said second delay circuit; the output of said second delay circuit being connected to the other input of said second phase detector; and a combining means, the output of said phase detectors being combined into a single output by said combining means.

4,138,678

INTEGRITY MONITORING SYSTEM FOR AN AIRCRAFT NAVIGATION SYSTEM

Ernest O. Kirner, Coral Springs, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 31, 1977, Ser. No. 829,412
Int. Cl.[2] G01S *7/40*
U.S. Cl. 343—17.7 **9 Claims**



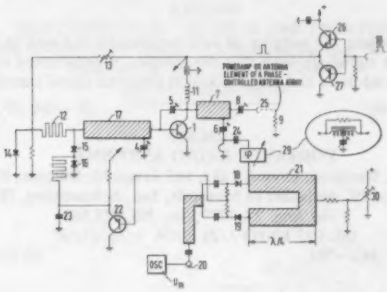
1. An integrity monitor for use in a navigation system having a ground station and airborne receiver means comprising at said ground station means for transmitting an integrity test signal into the field of interest of said ground station, said integrity test signal comprising a first coded portion identifying the type of test signal transmitted and a second coded portion equivalent to a predetermined quantity and comprising at said airborne receiver means for receiving and decoding said integrity test signal first and second portions and for comparing the decoded second portion against a predetermined reference signal to determine whether the predetermined quantity represented by said decoded second portion is within or without acceptable limits.

4,138,679

CIRCUIT FOR SYNCHRONIZING THE OSCILLATION OF A PULSED OSCILLATOR WITH A REFERENCE OSCILLATION

Dieter Leypold, and Peter Schucht, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 8, 1976, Ser. No. 703,374
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1975, 2532004
Int. Cl.[2] H01Q *3/26*; H03B *3/04*
U.S. Cl. 343—100 SA **7 Claims**



1. A circuit for synchronizing an oscillation U_o with a reference oscillation U_m of comparatively small amplitude, comprising:

a pulsed oscillator including an adjustable reactance for determining the frequency of oscillation;

a pulse input for receiving oscillator activation pulses;

an output for providing an output oscillation U_o;

a reference input for receiving a reference oscillation U_m;

an impedance converter;

a phase shifter adjustable up to 180°; and

a high resistance phase discriminator including said reference input and coupled to said output of said oscillator via said phase shifter, said phase discriminator connected to said adjustable reactance via said impedance converter to control and synchronize the output oscillation with the reference oscillation U_m.

4,138,680

SELECTIVE SAMPLING METHOD

James F. De Lorme, Paterson, and Arthur R. Tuppen, Wayne, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

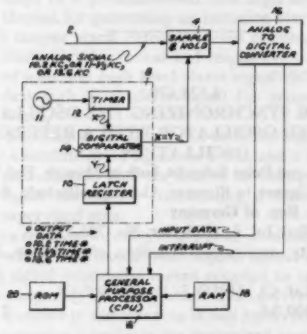
Continuation-in-part of Ser. No. 610,193, Sep. 4, 1975. This application Jul. 20, 1977, Ser. No. 817,283
Int. Cl.[2] G01S *1/30*
U.S. Cl. 343—105 R **11 Claims**

1. A method of isolating a preselected signal having a first frequency from at least one interferring signal having a frequency different from said first frequency comprising the steps of:

receiving said preselected and said at least one signal;

sampling said preselected and said at least one signal at predetermined intervals such that the phase and amplitude

of each sample with respect to previous samples is known; and



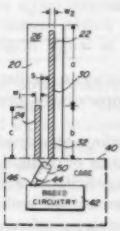
combining the samples of said preselected and said at least one signal are such that the samples of preselected signal are additive and those of said at least one signal cancelled.

4,138,681

PORTABLE RADIO ANTENNA

Allen L. Davidson, Crystal Lake, and James M. Durante, Elgin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 29, 1977, Ser. No. 828,565
Int. Cl.[2] H01Q *1/24, 9/04, 9/38, 21/00*
U.S. Cl. 343—702 **10 Claims**



1. A radio/antenna combination for operation on a wavelength λ comprising:

a radio body including radio circuitry having first and second antenna connections; and

an antenna comprising:

a first radiating element, extending from said body, and being electrically coupled to said first antenna connection, said first radiating element having a predetermined electrical length; and

a second radiating element, extending from said body and being electrically coupled to said body and said second antenna connection, said second radiating element being in predetermined electrically mutually coupled relationship with said first radiating element and having a predetermined effective electrical length such that upon transmission by said radio the current distribution along the radio body is minimized.

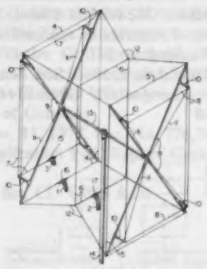
4,138,682

CUBICAL QUAD ANTENNAS WITH SPREADER-REINFORCED CROSSARMS

R. Michael Doherty, 11 Hillcrest Dr., Avon, Conn. 06001

Filed Jan. 24, 1977, Ser. No. 762,145
Int. Cl.[2] H01Q *7/00, 1/16*
U.S. Cl. 343—742 **13 Claims**

1. A quad antenna comprised of: a support structure; a first pair of crossarms mounted to the support structure; a second pair of crossarms also mounted to the support structure in spaced relationship from the first pair with the tips of both pairs of arms in spaced array; a first antenna element extending between spaced points on the first pair of crossarms; a second antenna element extending between spaced points on the second pair of crossarms; spreaders mounted on the pairs of crossarms at positions between opposite ends of the crossarms and projecting in generally perpendicular relationship from the



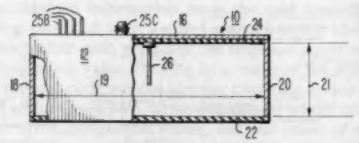
crossarms; a set of guy lines connected respectively to the crossarms on which the spreaders are mounted and extending from the respective spreaders to points on the arms spaced to each side of the spreaders; and another set of guy lines extending from the first pair of crossarms to the second pair of crossarms whereby the two sets of guy lines and the spreaders collectively cooperate to reinforece and strengthen the two pairs of crossarms.

4,138,683

SHORT RADIATING HORN WITH AN S-SHAPED RADIATING ELEMENT

Willard T. Patton, Moorestown, and Norman R. Landry, Willingboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,687
Int. Cl.[2] H01Q *3/26*
U.S. Cl. 343—783 **3 Claims**



1. A radiating element of a phased array radar, comprising:

a substantially rectangular alumina substrate;

four metal rectangular walls connected to said substrate to define a parallelepiped with an open side opposite from said substrate;

an integrated phase shifter that provides current in response to an excitation signal and is operable to cause said current to have a selected phase in response to a selection signal, said phase shifter being disposed upon said substrate within said parallelepiped; and

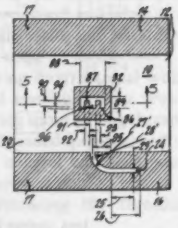
a metal wire probe connected to said phase shifter on said substrate and extending therefrom to the interior of said parallelepiped, said probe having the general shape of a hook with a shank that is parallel to said substrate.

4,138,684

LOADED MICROSTRIP ANTENNA WITH INTEGRAL TRANSFORMER

John L. Kerr, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 12, 1977, Ser. No. 796,289
Int. Cl.[2] H01Q *1/38*
U.S. Cl. 343—846 **10 Claims**



1. In a microstrip antenna configuration, apparatus comprising:

circuit board means of dielectric material having metallic ground plane means on one side thereof;

a first radiating element in the form of a first patch of metal etched on the opposite side of said circuit board means, said patch being continuous thereacross except for the removal of a portion in the central region thereof;

wherein there is additionally included a second radiating element in the form of a second patch of metal superimposed on said opposite side of said circuit board means in the region of removal of a portion of said first radiating element;

first and second feed means coupled respectively to said first and second radiating elements at respective points along a center line of each, to operate the first radiating element in a first frequency band and the second radiating element in a higher second frequency band;

wherein said second feed means includes a microstrip transformer etched on said opposite side of said circuit board means continuous with the second patch forming the second radiating element, the microstrip transformer extending inwardly in the second patch along the center line and formed by the removal of two portions of the patch on the two sides thereof so that each portion removed has the transformer on one side and a remaining portion of the patch on the other side; and

wherein a signal input jack is connected to the microstrip transformer at a connection point near the outer end thereof.

4,138,685

RECORDING WITH IMAGEWISE ALTERATION OF MAGNETIC ATTRACTION OF DONOR

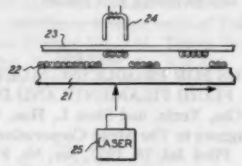
Richard Kellerman, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 8, 1977, Ser. No. 804,691
Int. Cl.[2] G01D *19/00*
U.S. Cl. 346—74.1 **23 Claims**

1. A method for marking a recording surface, which comprises the steps of:

(a) providing a substantially uniformly premagnetized donor layer having magnetically held thereon a substantially uniform coating of magnetically attractable marking particles;

(b) altering the magnetic properties in selected areas of the donor layer in image configuration so that the particles held on the altered areas of the donor layer may be attracted into marking contact with the recording surface by a magnetic field; and



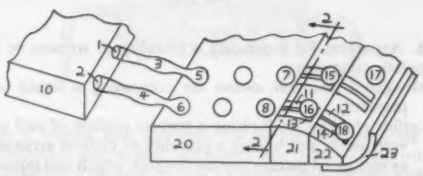
(c) applying a magnetic field to attract the marking particles from the altered areas of the donor layer to the recording surface.

4,138,686

ELECTROSTATIC NEUTRAL INK PRINTER

Ronald E. Graf, 9401 Union Pl., Gaithersburg, Md. 20760

Filed Apr. 6, 1977, Ser. No. 785,083
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **34 Claims**



1. An ink printer which comprises a structure which produces a number of ink streams, which streams eventually break into separate droplets of ink,

the ink of said ink streams contacting a surface of a first solid, upon which the ink from said ink streams is in droplet form during some interval,

which said printer causes a first set of selected ink droplets to each maintain motion on a trajectory on which the droplet continually touches said surface of said first solid until beyond a region in which the ink droplet would normally fly permanently off the surface of said first solid due to forces such as inertial forces and air pressure forces overcoming other forces such as adhesion and possibly air pressure forces,

each said trajectory on which each selected droplet continually touches the surface of said first solid until beyond said region being maintained as a result of sufficient voltages being applied on geometrical surfaces at a small depth interior from and parallel to selected portions of the surface of said first solid, said motion on any such said trajectory being caused in part by the addition of sufficiently large electrostatic forces being caused by said sufficient voltages, said electrostatic forces acting almost exclusively at contacting surfaces of each selected ink droplet and of individual ones of said selected portions of the surface of said first solid,

and which printer causes the remaining ink droplets selectively less affected by electrostatic fields to fly permanently off the surface of said first solid in said region in which the ink droplets would normally fly permanently off the surface due to forces such as inertial forces and air pressure forces overcoming other forces acting toward said first solid such as adhesion and possibly air pressure,

said surface of said first solid containing a number of portions of the surface, each of said number of portions of the surface having an associated geometrical surface at some small depth interior to the portion and parallel to that

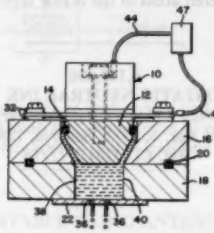
portion, and each said associated geometrical surface being controllable to exist in any of at least two voltage states at any future instant, assuming that appropriate control signals are given during any interval shortly preceding and including that instant.

4,138,687

APPARATUS FOR PRODUCING MULTIPLE UNIFORM FLUID FILAMENTS AND DROPS

Charles L. Cha, Xenia, and Shou L. Hou, Centerville, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jul. 18, 1977, Ser. No. 816,609
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **10 Claims**



1. Apparatus for producing a plurality of streams of fluid droplets, comprising:

elongated reservoir means for containing a liquid under pressure;

orifice plate means forming a bottom portion of said reservoir means and having a plurality of orifices arranged in an elongated pattern therein through which said liquid can be expelled from said reservoir means in a series of continuously flowing streams;

elongated piston means disposed above said reservoir means in vibrational isolation therefrom and having a bottom surface in contact with said liquid;

a plurality of separated but closely spaced electroacoustical transducer means engaging a top surface of said piston means opposite said bottom surface in end-to-end arrangement and disposed outside of said reservoir means, for causing vertical translational movement of said piston means so as to generate a continuous series of plane waves and induce a substantially uniform pressure disturbance in said fluid issuing from said orifices;

support means for resiliently supporting said plurality of transducer means and said piston means on said reservoir means; and

means for simultaneously repetitively activating said stimulator means to cause a series of said disturbances.

4,138,688

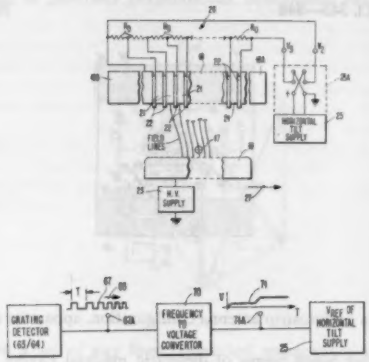
METHOD AND APPARATUS FOR AUTOMATICALLY CONTROLLING THE INCLINATION OF PATTERNS IN INK JET PRINTERS

Roderick S. Heard; James D. Hill, and David W. Phillips, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1977, Ser. No. 864,066
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **19 Claims**

1. An ink jet printer comprising in combination:

a nozzle for emitting a stream of ink drops; a charging electrode for charging said ink drops in accordance with signals to be recorded; first and second spaced apart deflection electrodes respectively on opposite sides of said stream of ink drops, voltage supply means connected to said electrodes to effect an electric field intermediate said electrodes to deflect ink drops in accordance with the magnitude of the charges on said drops; record receiving means for forming images indicative of the signals on said drops deflected by said electrodes; carrier means mounting said nozzle and electrodes and means for effecting relative movement between said record receiving means and said carrier means; and electrical means for distorting the electric field between said electrodes, monitoring



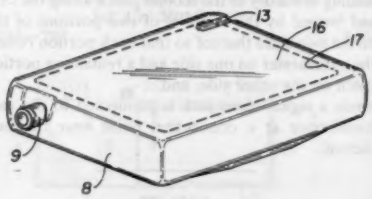
means for detecting the velocity of said relative movement between said carrier and said record receiving means and means associated with said electrical means responsive to said monitoring means for adjusting the distortion in said electric field between said electrodes to control the tilt of an image formed on said record receiving means by said ink drops.

4,138,689

ROCKABLE PHOTOGRAPHIC TRAY HAVING A SUBSTANTIALLY FLAT INTERIOR SHEET SUPPORT

Anthony P. Montalbano, Glen Cove, N.Y., assignor to Ambico Inc., Lynbrook, N.Y.

Filed Sep. 7, 1976, Ser. No. 720,674
Int. Cl.[2] G03D *13/02*
U.S. Cl. 354—337 **13 Claims**



1. An integral, unitary, molded plastic photographic tray structure comprising:

a bottom member having a first bottom portion defining on the outer surface of said tray a first substantially flat bottom area for resting on a support surface in a stable position, and a pair of second bottom portions each of which, on the outer surface of said tray, define upwardly inclined bottom areas relative to said first substantially flat bottom area to permit the tray to be rocked on the support surface, said second bottom surface portions being respectively located on opposite sides of said first bottom portion;

said bottom member defining a substantially flat, photographic sheet receiving, lower surface on the inside of the tray over said first substantially flat bottom area and over

at least a substantial portion of said upwardly inclined bottom areas for permitting a photographic sheet to remain in its flat state over substantially the complete interior area of the tray;

side walls integral with each other and integral with said bottom member, said side walls extending completely around and upwardly from said bottom member to form said tray;

an inwardly directed integral lip portion extending from the upper portions of said side walls and integral with said side walls, said lip portion extending completely along and around said side walls and inwardly toward the central portion of the tray;

at least one pouring spout integral with at least one of said side walls and communicating with the interior of the tray, said pouring spout having threads thereon for receiving a mating threaded member, and said at least one side wall which is integral with said pouring spout having a setback or a recessed portion remote from said threads to facilitate manipulating the threaded member on the threads of said spout; and

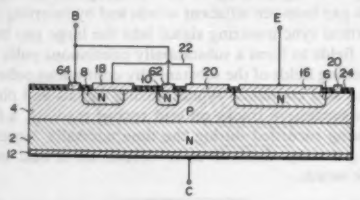
a plurality of elongated rib members integrally formed in said bottom member and extending in a given direction of the tray.

4,138,690

DARLINGTON CIRCUIT SEMICONDUCTOR DEVICE

Keiji Nawa, and Masami Iwasaki, both of Kawasaki, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 10, 1977, Ser. No. 795,436
Claims priority, application Japan, May 11, 1976, 51-58409
Int. Cl.[2] H01L *27/02;* **H03K** *3/26*
U.S. Cl. 357—46 **12 Claims**



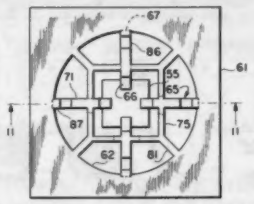
1. A Darlington circuit semiconductor device comprising a semiconductor body, first and second transistors darlington-connected and formed in said semiconductor body, diode means formed in said semiconductor body to permit, when said first and second transistors are switched off, a base current of said first transistor to flow in the reverse direction to enhance a switching speed of said first and second transistors, and resistor means formed in said semiconductor body, the collector and base of said first transistor being connected to the collector and emitter of said second transistor, respectively, said resistor means being connected in parallel to said diode means, and the anode and cathode of said diode means being connected to the base of said first transistor and the base of said second transistor, respectively.

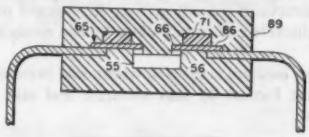
4,138,691

FRAMED LEAD ASSEMBLY FOR A SEMICONDUCTOR DEVICE COMPRISING INSULATOR REINFORCING STRIPS SUPPORTED BY A FRAME AND MADE INTEGRAL WITH LEAD STRIPS

Manabu Bonkohara, and Hisao Kasuga, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1977, Ser. No. 804,228
Int. Cl.[2] H01L *29/48, 29/44, 29/52*
U.S. Cl. 357—70 **14 Claims**





1. In a framed lead assembly for use in manufacturing a semiconductor device, said semiconductor device comprising a semiconductor element having a plurality of electrode areas, said lead assembly comprisng a plurality of lead strips of an electrically conductive material and means for supporting said lead strips in generally radially extended positions, said lead strips comprising radially inward end portions, respectively, for connection to said electrode areas, the improvement wherein said means comprises a frame member having an inside edge generally defining an opening for receiving said semiconductor element, a plurality of reinforcing strips of an electrically insulating material rendered integral with at least predetermined portions of said lead strips, respectively, and connection means connecting said reinforcing strips with said frame member to support said lead strips in said positions, said reinforcing strips substantially conforming in shape and dimensions with those areas of said lead strips with which said reinforcing strips are rendered integral.

4,138,692

GAS ENCAPSULATED COOLING MODULE

Robert G. Meeker, La Grangeville; William J. Scanlon, Hopewell Junction, and Zvi Segal, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,716
Int. Cl.[2] H01L *25/04, 23/42, 23/44*
U.S. Cl. 357—82 **15 Claims**

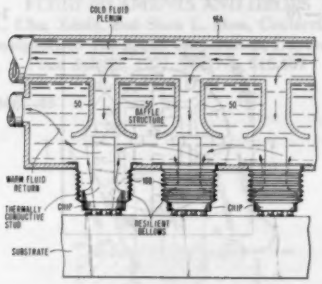
1. A cooling module for integrated circuit chips, said cooling module comprising:

a multilayer ceramic substrate having a first essentially planar surface and a second essentially planar surface, said multilayer ceramic substrate including an electrical circuit pattern contained therein and on at least one of said planar surface;

a plurality of integrated circuit chips supported on said first planar surface of said substrate and electrically connected to said electrical circuit pattern of said multilayer ceramic substrate, each of said semiconductor chips having an essentially exposed planar surface;

a plurality of electrically conductive connector pins extending from said second planar surface of said substrate, said plurality of electrically conductive pins being electrically connected to said electrical circuit pattern of said substrate;

module cap means hermetically sealed to said substrate to provide a volume encompassing said plurality of chips;



a plurality of bellows like structures, each of said bellows like structures extending from the exposed planar surface of a discrete one of said chips to said module cap means; and

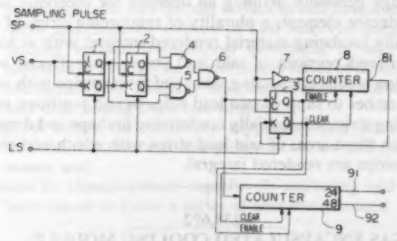
a cooling medium contained within said hermetically sealed volume formed by said substrate and said module cap means.

4,138,693

INFORMATION DENSITY DECISION CIRCUIT

Yoshio Iizuka, Sagamihara, Japan, assignor to Fujitsu Limited, Japan

Filed Mar. 11, 1977, Ser. No. 776,755
Claims priority, application Japan, Mar. 22, 1976, 51-31093
Int. Cl.[2] H04N *1/17*
U.S. Cl. 358—288 **9 Claims**



1. An information density decision circuit for deciding the information density of binary-coded picture signals derived from scanning a picture along predetermined scanning lines, comprising:

first means for detecting transition points of said binary-coded picture signal corresponding to information transitions in said scanning line of said picture,

second means for counting the number of said transition points of the binary-coded picture signal within a section thereof and for generating an output signal when said count has reached a predetermined certain value indicating the decided information density of said picture signal; and

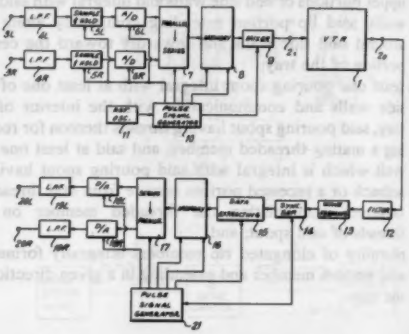
enabling means responsive to detection of a first one of said transition points by said first means for enabling the counting of said second means, thereby defining the section of said binary-coded picture signal within which said number of transition points is counted by said second means.

4,138,694

VIDEO SIGNAL RECORDER/REPRODUCER FOR RECORDING AND REPRODUCING PULSE SIGNALS

Toshitada Doi, Yokohama, and Akira Iga, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1977, Ser. No. 771,350
Claims priority, application Japan, Feb. 24, 1976, 51-19198
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—127 **25 Claims**



1. A method of recording pulse encoded information in the form of successive plural-bit words on a record medium by a video signal recorder of the type normally adapted to record video signals, such as composite television signals, on said record medium and normally having a control mechanism that is responsive to the synchronizing signals contained in said video signals for controlling the recording operation thereof, said method comprising the steps of supplying successive ones of said plural-bit words, generating simulated horizontal and vertical synchronizing signals synchronized to the frequencies of the horizontal and vertical synchronizing signals normally included in said video signals; time-compressing each of said plural-bit words by writing said words into an addressable memory at a first rate and contemporaneously reading said words out of said memory at a second, faster rate to insert relatively short gaps between adjacent read-out words and to insert a relatively large gap between adjacent fields of words, combining the simulated horizontal and vertical synchronizing signals with said plural bit words without loss of any of such words by inserting a simulated horizontal synchronizing signal into each gap between adjacent words and by inserting a simulated vertical synchronizing signal into the large gap between adjacent fields to form a substantially continuous pulse signal; and recording fields of the substantially continuous pulse signal formed of said combined synchronizing signals and plural-bit words in successive tracks on said record medium, a field of words being recorded during the time normally required for recording a video field, so as to record all of said supplied plural-bit words.

4,138,695

CASSETTE CENTRAL DICTATION SYSTEM

Fred C. Bolick, Jr.; Theodore Titus, IV, and Said Mohammadioun, all of Atlanta, Ga., assignors to Lanier Business Products, Inc., Atlanta, Ga.

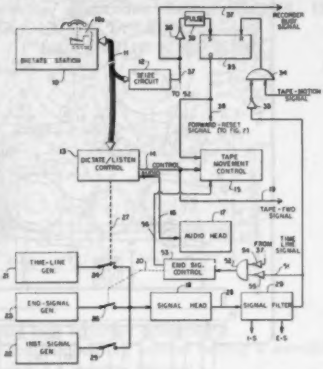
Division of Ser. No. 554,476, Mar. 3, 1975, which is a continuation of Ser. No. 327,501, Jan. 29, 1973, abandoned. This application Dec. 22, 1976, Ser. No. 753,360
Int. Cl.[2] G11B *15/68*
U.S. Cl. 360—92 **1 Claim**

1. A cassette recording apparatus having a plurality of operational modes for causing tape movement in a cassette, wherein the improvement comprises:

a first means for sensing the movement of tape in a first cassette in recording interrelationship with a transducer

when said cassette recording apparatus is in a recording mode of operation for causing tape movement;

a second means for substituting a second cassette for said first cassette in response to the detection by said first means of the absence of tape movement in said first cassette when said cassette recording apparatus is in said



recording mode of operation for causing tape movement; and

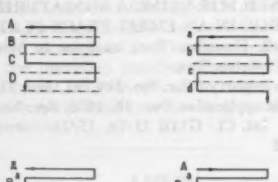
signal means responsive to said second means for providing an audible signal corresponding to said second means becoming operative and continuing until the cassette substitution has been terminated.

4,138,696

DEVICE FOR AUTOMATICALLY RECORDING, REPRODUCING AND TRANSLATING, A MAGNETIC TRANSDUCER

Milos Blazevic, 62, rue Georges Ferrand, 94380 Bonneuil-sur-Marne, France

Filed Feb. 14, 1977, Ser. No. 768,563
Claims priority, application France, Mar. 25, 1976, 76 08629
Int. Cl.[2] G11B *25/04*
U.S. Cl. 360—2 **5 Claims**



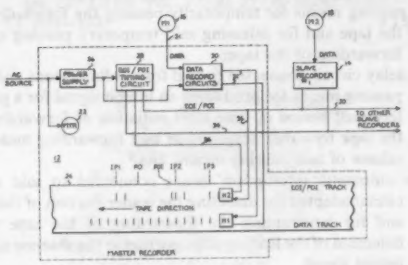
1. An automatic device for recording, reproducing and translating said device being of the type using magnetic rectangular cards having visible horizontal lines of writing on their front surfaces which are readable from left to right, and a magnetic coating on their rear surfaces to support mangetic tracks traverse alternately from left to right and from right to left by a movable magnetic head, a skipping mechanism for producing relative displacement between said cards and device to permit passage from one line to the next, the improvement according to which each line of writing on the front surface corresponds to two tracks on the rear surface of each card, namely an upper track and a lower track, each upper track of a line is traversed by said head in a direction opposite to that of the upper track of the preceding line and that each lower track is traversed in a direction opposite to the direction of travel over the upper track of the corresponding line, said device being arranged to permit the choice between four different patterns of travel the first corresponding to the alternate travel along the upper tracks, the second corresponding to the alternate travel along the lower tracks, the third corresponding to the alternate travel along the upper track of a first line, followed by the lower track of the same line, the lower track of the next line, and finally the upper track of the next line, and the fourth method of exploration corresponding to the exploration of an upper track of a first line, then the lower track of the same line, then an inactive return to the other end of the track to subsequently traverse the upper track of the following line and the lower track of the same following line, and so on.

4,138,697

DATA RECORDING SYSTEM FOR INDICATING POWER OUTAGE ON MASTER AND SLAVE RECORDERS

Joseph G. Russillo, Dover, N.H., and William C. Earl, Corona, Calif., assignors to General Electric Company, Somersworth, N.H.

Filed Mar. 2, 1978, Ser. No. 882,739
Int. Cl.[2] G11B *5/00, 15/12*
U.S. Cl. 360—6 **5 Claims**



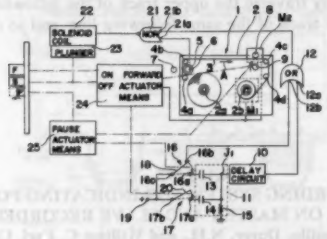
1. An improved data recording system of the type including recorders susceptible to a power outage condition having data recording circuits for recording data on magnetic tape derived from pulse initiators in meter devices associated with the respective recorders comprising:

a master recorder and at least one slave recorder, each of said recorders including a time record circuit having a recording head for normally recording time interval marks on said magnetic tape as a time reference for said data, said master recorder having a timing circuit including means for providing end-of-interval pulses to its time record circuit at periodic intervals so long as power is being supplied to said master recorder to effect the writing of said time interval marks on the magnetic tape by said master recorder's recording head, said timing circuit further including means for detecting a power outage condition lasting in excess of a predetermined time duration to supply a power outage pulse to said master recorder's time record circuit to effect the writing of a power outage mark on the magnetic tape by said master recorder's record head which identifies the time of the occurrence of the power condition and the time interval in which the power outage condition occurred; and means connecting the output of the time record circuit of said master recorder to the input of the time record circuit of each of said slave recorders, whereby the end-of-interval pulses and the power outage pulse generated by said master recorder effect a simultaneous recording of said time interval and power outage marks on the magnetic tape of all of the recorders.

4,138,698
MAGNETIC TAPE CONTROL SYSTEM

Akira Kokei, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 17, 1977, Ser. No. 842,872
Claims priority, application Japan, Oct. 20, 1976, 51-141805[U]
Int. Cl.[2] G11B *15/48*
U.S. Cl. 360—74 5 Claims



1. In a tape recording and/or reproducing device of the type employing magnetic tape provided with a leader portion at opposite ends thereof, a tape control system comprising:

a forwarding means for forwarding the tape;

a pausing means for temporarily pausing the forwarding of the tape and for releasing said temporary pausing of the forwarding of the tape;

a delay circuit connected to said forwarding means and said pausing means for producing an inhibit signal for a predetermined period of time after initiation of forwarding of the tape by either actuation of said forwarding means or release of said pausing means; and

an automatic interuption means connected to said delay circuit adapted for detecting the leader portion of the tape and for interrupting the forwarding of the tape upon detection of the leading edge portion in the absence of said inhibit signal.

4,138,699
AUTOMATIC TAPE LOADING TYPE RECORDING AND/OR REPRODUCING APPARATUS

Junichi Ura, Yokohama, and Toshio Murakawa, Sagamihara, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 2, 1977, Ser. No. 802,664
Claims priority, application Japan, Jun. 4, 1976, 51-65262; Jun. 4, 1976, 51-65263
Int. Cl.[2] G11B *15/66, 23/04*
U.S. Cl. 360—85 8 Claims

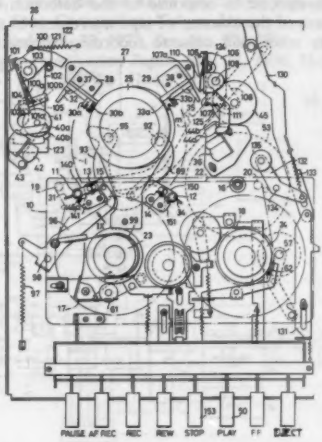
1. An automatic tape loading type recording and/or reproducing apparatus comprising:

a guide drum having heads for recording or reproducing signals on or from a tape;

a pair of tape guide means for engaging said tape, said tape guide means moving to a specific position in the vicinity of said guide drum where said tape is fully loaded, said guide means guiding the tape at said specific position in a manner such that the tape travels along a specific tape travel path and over a specific angular expanse with respect to the guide drum;

means responsive to a loading operation for moving said tape guide means in a specific direction to said specific position when the tape is loaded into said specific tape travel path and responsive to an unloading operation for moving the tape guide means in the reverse direction away from said specific position when the tape is removed from the specific tape travel path; and

checking means for contracting the tape guide means while in said specific position and preventing displacement of

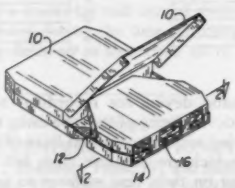


the tape guide means in said reverse direction during either recording or reproducing mode of operation.

4,138,700
CONTAINER FOR USING A MINIATURIZED CARTRIDGE IN AN EIGHT-TRACK PLAYER

Hugh M. Russell, Houston, Tex., assignor to Module-Eight Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 589,792, Jun. 23, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,148
Int. Cl.[2] G11B *23/06, 15/18*
U.S. Cl. 360—93 12 Claims



1. A modular tape cartridge assembly comprising:

a cartridge container having removably mounted therein two pinch wheels, one pinch wheel being located at each end of the container, and

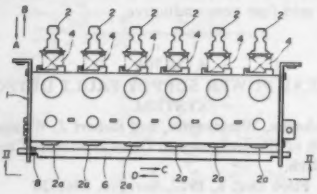
a tape cartridge containing a continuous loop of magnetic tape,

said tape cartridge being received in said container cartridge with said tape being disposed in abutting relationship to at least one of said pinch wheels.

4,138,701
CASSETTE EJECTOR FOR TAPE RECORDER WITH BOTH PLAY AND EJECTION INHIBIT

Katsuo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 18, 1977, Ser. No. 843,297
Claims priority, application Japan, Oct. 20, 1976, 51-140790[U]; Oct. 20, 1976, 51-140791[U]
Int. Cl.[2] G11B *15/04, 15/18*
U.S. Cl. 360—96 5 Claims



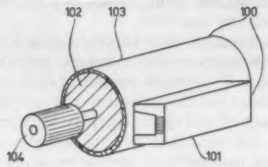
1. A cassette tape recorder comprising:
a cassette accommodating section having a movable cover and receiving a cassette therein;
a plurality of operating members arranged parallel with each other in a row and movably in a substantially same direction between operative and inoperative positions for controlling functions of said tape recorder;
frame means for movably supporting said plurality of operating members;
cassette ejection means capable of being actuated for opening said cover to expose said cassette accommodating section for insertion and extraction of the cassette; and
stopping means comprising a unitary member supported on said frame means to extend in a direction substantially perpindicular to said operating members in said row and coupled to said ejection means, said stopping means being movable in a direction crossing the moving direction of said operating members to selectively occupy, when said ejection means is not actuated, a first position where said stopping means is locked by at least one of said operating members which extends into the moving path of said stopping means in the operative position thereof so as to inhibit the actuation of said ejection means and, when said ejection means is actuated, a second position where said stopping means is located in the moving path of said at least one operating member when all of said operating members are in the inoperative positions so as to inhibit the movement of said one operating member to the operative position.

4,138,702
HEAD ARRANGEMENT FOR PERPENDICULAR RECORDING INFORMATION ON A MAGNETIC RECORD CARRIER

Jean G. Magnenet, Belfort, France, assignor to Compagnie Honeywell Bull, Paris, France

Continuation of Ser. No. 651,156, Jan. 21, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 854,682
Claims priority, application France, Jan. 23, 1975, 75 02137
Int. Cl.[2] G11B *5/14, 5/115, 5/27*
U.S. Cl. 360—125 9 Claims

1. An arrangement for recording information on a magnetic record carrier comprising a plurality of magnetic recording heads, each said magnetic recording head including an electromagnet, a recording pole and a flux closing pole, the cross-section of the pole face of the recording pole being smaller than the cross-section of the pole face of the flux closing pole, a magnetic shunt, said magnetic shunt being disposed on one side of said record carrier and close thereto and each said magnetic recording head being disposed on the other side of said record carrier and close thereto, so as to form a gap of constant dimension with said magnetic shunt and a closed magnetic circuit in which the magnetic flux is substantially perpendicular to the surface of the carrier, nonmagnetic encapsulation means for supporting said recording heads as a modular unit in parallel arrangement, each said recording head being separated from

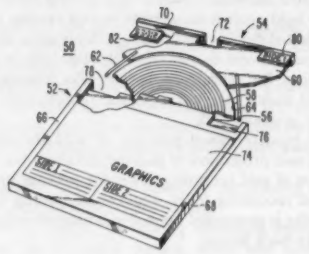


the adjoining head by said nonmagnetic encapsulation means and a first and second side plate disposed over said encapsulation means and adjacent the end-most sides of said parallel arranged recording heads.

4,138,703
VIDEO DISC PACKAGE

Frederick R. Stave, and Leslie A. Torrington, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 2, 1977, Ser. No. 821,200
Int. Cl.[2] G11B *5/82, 17/00, 25/04;* B65D *85/02*
U.S. Cl. 360—133 8 Claims



1. A packaged record comprising:
(A) a disc record;
(B) a jacket having a record enclosing cavity and an end access opening in communication therewith;
(C) a record retaining spine withdrawably received within said cavity; said spine substantially extending into said end access opening when it is fully inserted into said jacket;
(D) indicia secured to the foremost exposed edge of said spine for associating a first side of said record with a given side of said spine; said record being enclosed within said package such that said first side of said record is on the same side of said cavity as said given side of said spine; and
(E) means secured to said spine for limiting relative motion between said spine and said enclosed record.

4,138,704
OPERATING MECHANISM OF TAPE RECORDER

Akio Nakazono, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corp., Aichi, Japan

Filed Oct. 31, 1977, Ser. No. 847,232
Claims priority, application Japan, Nov. 8, 1976, 51/149882
Int. Cl.[2] G11B *5/00*
U.S. Cl. 360—137 2 Claims

1. An operating mechanism of a tape recorder comprising at least a recording lever, a play-back lever and a review lever or a cue lever each capable of being depressed from a first position to a second position, wherein if the review or the cue lever is depressed when the recording or the play-back operation is

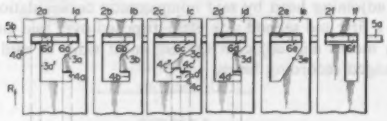
activated by the recording lever and/or the play-back lever being depressed, the position for play-back operation is maintained during either of the recording or the play-back operations, said mechanism comprising:

(a) a first slider bar spring biased in a first direction,

(b) a second slider bar spring biased in a second direction, opposite said first direction,

(c) said first and second slider bars extending transversely of and perpendicularly to said levers and being slidable in a plane orthogonal to a major surface of each of said levers,

(d) said first slider bar having at least one projection associated with each of said recording, play-back and review or cue levers, said recording, play-back and review or cue levers having cam surfaces thereon engaging said projections for moving said first slider bar in said second direction,



(e) said second slider bar having at least one projection associated with said recording lever, said recording lever having a surface for contacting said projection of said second slider bar,

(f) said first and second slider bars having cooperating engagement surfaces wherein said second slider bar is normally held against movement in said second direction by said first slider bar and wherein depression of said cue or play-back levers moves said first slider bar in said second direction for permitting spring bias movement of said second slider bar in said second direction to a predetermined position, and

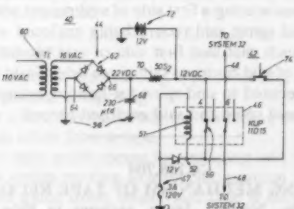
(g) said predetermined position of said second slider bar fixing said projection of said second slider bar against said surface of said recording lever for preventing depression of said recording lever whereby recording by said tape recorder is prevented upon depression of said cue, review or play-back levers.

4,138,705

OVER-POWER SAFETY DEVICE FOR MOTOR DRIVEN SYSTEM

Joseph D. Doll, Gering, Nebr., assignor to Lockwood Corporation, Gering, Nebr.

Filed Apr. 22, 1977, Ser. No. 789,890
Int. Cl.[2] H02H *9/04*
U.S. Cl. 361—42 **18 Claims**



1. An over-voltage protected irrigation system comprising:

a motor driven irrigation system, including at least one AC induction motor connected to a system chassis; and

an over-voltage detecting device for interrupting power supplied to said motor when the voltage differential between said chassis and earth ground exceeds a selected value, the detecting device including:

a relay responsive to a control signal for alternately conducting and interrupting energization to said motor,

a rectifier having one input terminal coupled to a source of AC voltage and having another input terminal coupled to said chassis for referencing the output voltage therefrom to the chassis voltage, and having its output terminal coupled to said relay; and

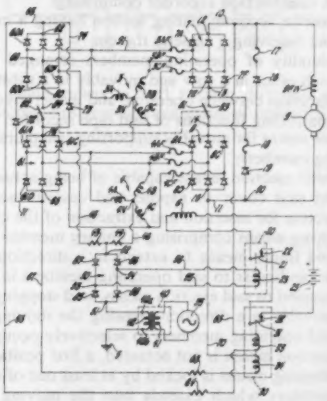
a fuse coupled to said relay and adapted to be coupled to earth ground whereby a voltage differential greater than a selected value between said chassis and earth ground renders said fuse nonconductive.

4,138,706

ELECTRICAL POWER SUPPLY FAULT DETECTING SYSTEM

Lauren L. Johnson, Westchester, and Robert J. Wilson, Bolingbrook, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1977, Ser. No. 856,526
Int. Cl.[2] H02H *7/06*
U.S. Cl. 361—42 **8 Claims**



1. An electrical power supply fault detecting system for use with an alternator of the type having an electrically energized exciting field winding and two discrete polyphase output winding groups each having a neutral point, comprising:

means for full-wave rectifying the output potential of each of said alternator output winding groups and for applying the rectified potential across a system direct current output circuit isolated from a selected point of reference or ground potential;

means for applying an electrical potential across a selected point of reference or ground potential and said neutral points of said output winding groups in parallel whereby a system fault to said selected point of reference or ground potential completes an electrical circuit for said electrical potential; and

means responsive to the flow of current through said electrical circuit as a result of a system fault to said point of reference or ground potential for deenergizing said alternator exciting field winding.

4,138,707

GROUND FAULT PROTECTIVE SYSTEMS WITH PREDETECTION NEUTRALIZATION OF REACTIVE CURRENTS

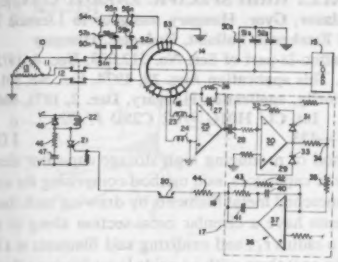
Thomas A. O. Gross, Lincoln, Mass. 01773

Filed Jul. 21, 1977, Ser. No. 817,579
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—45 **12 Claims**

1. A ground fault protective system for use with a power

distribution system for supplying a.c. power to a known load from at least two supply conductors, at least one of said supply conductors exhibiting a measureable downstream reactance to ground giving rise to net reactive differential currents in said supply conductors not characteristic of a real ground fault comprising:

differential current sensing means responsive to currents in said supply conductors for generating fault signals representing differential currents carried by said supply conductors; and



neutralizing means comprising at least one auxiliary circuit branch including predetermined impedance means so connected to at least one of said supply conductors and proportioned relative to said downstream reactance to ground as to exert a neutralizing effect on said net reactive differential currents substantially counterbalancing the effect on said fault signals of said downstream reactance to ground.

4,138,708

DRIVE CIRCUIT FOR SOLENOID PUMP

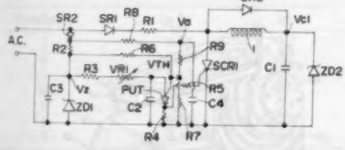
Sadao Takeshima, Higashi Matsuyama, Japan, assignor to Jidoshakiki Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1977, Ser. No. 825,198

Claims priority, application Japan, Nov. 26, 1976, 51-157983[U]; Dec. 23, 1976, 51-173092[U]

Int. Cl.[2] H01H *47/00*

U.S. Cl. 361—156 **5 Claims**



1. A drive circuit for a solenoid pump comprising a series combination of a rectifier and a resistor connected between one terminal of an a.c. source and one end of the solenoid of the pump, another rectifier connected in shunt with the solenoid, a thyristor connected between said one end of the solenoid and the other terminal of the a.c. source, a capacitor connected between the other end of the solenoid and the other terminal of the a.c. source, and a trigger circuit for supplying a trigger pulse to the thyristor to turn it on, thereby causing the solenoid to be energized by electrical energy stored on the capacitor as it discharges through the thyristor, wherein said trigger circuit is formed as a relaxation oscillator including a programmable unijunction transistor and having an oscillation frequency which varies inversely with a fluctuation in said source voltage, said thyristor being rendered conductive in response to an oscillation output from said trigger circuit, whereby the energy discharged by said capacitor per unit time is maintained substantially constant despite a fluctuation in said source voltage.

4,138,709

PROXIMITY SWITCH

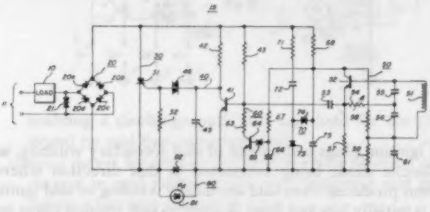
John A. Colwill, Quorn, England, assignor to Square D Company, Park Ridge, Ill.

Continuation of Ser. No. 624,684, Oct. 22, 1975, abandoned.

This application Feb. 25, 1977, Ser. No. 771,870

Int. Cl.[2] H01H *36/00*

U.S. Cl. 361—180 **18 Claims**



1. A proximity switch of the type connectable in series with an electrical source and an electrical load, having portions energizable from the electrical source, and operable in response to the proximity of a metallic object to shunt current from the electrical source through the proximity switch and thereby connect the source to the load, said proximity switch comprising:

a sensing means for producing a signal in response to the presence of a metallic object within a selected distance from the proximity switch;

a switching means connected for connection between the source and the load for disconnecting said source from said load and connecting said source to said load by shunting the current from said source through said switching means;

a switching control means responsive to the sensing means signal for controlling the swing means;

an energy storage means for storing electrical energy received from the electrical source when said source is disconnected from the load by the switching means and for supplying electrical energy to selected portions of the proximity switch when said source current is shunted to said load through said switching means; and

an operational delay means responsive to the initial connection of the proximity switch to the power source for turning on the control switching device to shunt the switching capacitor for a preselected time after said initial energization to thereby prevent the turning on of the silicon controlled rectifier for said preselected time.

4,138,710

IGNITION DEVICE

Mizoguchi Tsukuru, 660-106, Kanmatsu-cho, Kishiwada-shi, Osaka, Japan

Filed Jul. 3, 1975, Ser. No. 592,750

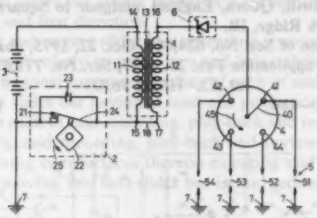
Claims priority, application Japan, Nov. 6, 1974, 49-128217

Int. Cl.[2] F02P *9/00*

U.S. Cl. 361—263 **5 Claims**

1. In an ignition device of an internal conbustion engine which includes an ignition coil having a primary winding and a secondary winding; a direct current source which applies current to the primary winding of the ignition coil; a breaker point which makes and breaks current of the primary winding from the direct current source; a cam which rotates, associated with rotation of a crankshaft of the internal conbustion engine, and opens and shuts the breaker point; a condenser connected across the breaker point; a distributor having a given plurality of contact points and a distributing arm which rotates associ-

ated with rotation of the cam; and a number of ignition plugs, corresponding in number to the contact points of the distributor, coupled with the secondary winding through respective ones of the contact points of the distributor; the improvment comprising at least one avalanche diode in series with each of



said ignition plugs and an end of said secondary winding, said avalanche diode being connected in that direction wherein current produced from said secondary winding of said ignition coil is initially blocked from flowing to said ignition plugs until said avalanche diode breaks down at substantially the moment when said breaker points turns to OFF from ON.

4,138,711

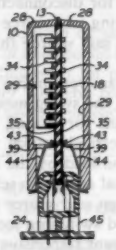
STATIC CONTROL DEVICE FOR PRINTED CIRCUIT PACKAGE

Edwin L. Bremenour, Euclid; Timothy E. McAdams, Willowick, and Clifford A. Rhodes, Willoughby, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sep. 29, 1977, Ser. No. 838,172

Int. Cl.[2] H05K *5/00*

U.S. Cl. 361—424 **11 Claims**



1. A lead shorting device for a printed circuit board having mounted thereon at least one semiconductor element having terminals electrically engaging conducting circuit paths on said board, said paths terminating in spaced apart, conducting termination pads, and wherein said circuit board is removably insertable in an elongated connector device having contacts arranged for electrical engagement with respective ones of said termination pads and an insulating housing at least partially surrounding said contacts, said housing defining an exposed camming surface, and wherein said semiconductor device is susceptible to deleterious effects in the presence of a difference in potential across its terminals prior to insertion of said board into said connector device, said lead shorting device including:

an insulating support member adapted for attachment to said circuit board and extending across the termination pads electrically connected to said semiconductor element; and

a conducting terminal shorting member supported by said support member including a plurality of integral, resilient conducting portions arranged for normal engagement with and electrically shorting each of the respective termination pads electrically connected to the semiconductor device, the resilient conducting portions of said shorting member each having cam follower means cooperating with the camming surface of the housing of said connector device for separating said portion from said termination pads upon insertion of said circuit board into said connector device.

4,138,712

PRODUCTION OF CAPACITOR ELEMENTS HAVING ESPECIALLY HIGH SPECIFIC ENERGY CONTENT

Zoltán Leszlauer, Gyor, Hungary, assignor to Licencia Találmanyokat Ertekesito Vallalat, Budapest, Hungary

Continuation-in-part of Ser. No. 312,058, Dec. 4, 1972, abandoned. This application Aug. 28, 1974, Ser. No. 501,285

Claims priority, application Hungary, Dec. 2, 1971, 634

Int. Cl.[2] H01G *9/00;* **C25D** *11/02*

U.S. Cl. 361—433 **2 Claims**

1. A method of producing high storage capacitor elements for electrolytic capacitors, said method comprising the steps of producing unetched metal filaments by drawing such that said metal filaments have a circular cross-section along its entire length with a radius r_1, and oxidizing said filaments at a forming voltage to coat them with an oxide layer having a thickness substantially equal to

$$r_1\left(e^{\frac{U}{r_1 E_m}} - 1\right)$$

wherein U is the maximum operating voltage and Em is the maximum field strength of the oxide layer, r_1 being equal to 2U/cm.

4,138,713

LIGHT FIXTURE

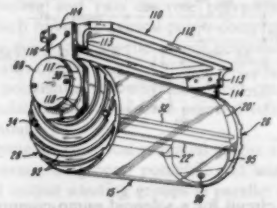
Roman Szpur, Dayton, Ohio, assignor to Panabeam Corp., Dayton, Ohio

Continuation-in-part of Ser. No. 618,136, Sep. 30, 1975, Pat. No. 4,021,660. This application Apr. 11, 1977, Ser. No. 786,588

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.[2] F21V *29/00, 31/02, 7/12*

U.S. Cl. 362—218 **15 Claims**



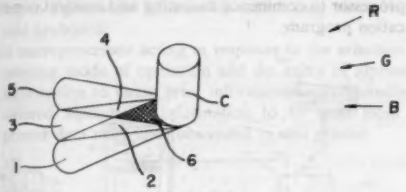
1. An improved light fixture adapted for use in an environment of high moisture and/or high dust particles, comprising an elongated transparent tube having opposite end portions and a center axis, a set of end closure members mounted on corresponding said end portions of said tube, means for positively securing said end closure members to the corresponding said end portions of said tube, a generally U-shaped reflector panel disposed within said tube and having an inner reflecting surface, means located on at least one of said end closure members eccentrically of said center axis and supporting an elongated lamp element with an axis spaced generally parallel to said center axis of said tube and between the inner surface of said tube and said center axis of said tube, and said reflector panel extends between said lamp element and the inner surface of said tube.

4,138,714

METHOD OF LIGHTING FOR COLORED SHADOWS

Michihiro Tsuchihashi; Masato Saito; Makoto Yamanoshita, all of Amagasaki; Hidetoshi Katsura, Kamakura; Osamu Myodo, Kamakura, and Koichiro Maeyama, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1977, Ser. No. 798,459
Claims priority, application Japan, Oct. 25, 1976, 51-128035
Int. Cl.[2] F21P *5/04*
U.S. Cl. 362—231 3 Claims



1. A method of lighting for colored shadows which comprises arranging color light sources in three R, G and B groups of at least one light source for yellow to red (R group); at least one light source for green (G group) and at least one light source for violet to blue (B group) and illuminating an object to obtain colored shadows of the object to give the ratios of illuminances by the color light sources;

$$i_R = \frac{I_R}{I_R + I_G + I_B}$$

$$i_G = \frac{I_G}{I_R + I_G + I_B}$$

$$i_B = \frac{I_B}{I_R + I_G + I_B}$$

in a range surrounded by the following ratios of j-k-l-m-n-e-f-j in a triangular coordinate wherein I_R designates an illuminance by only the lamp in the R group; I_G designates an illuminance by only the lamp in the G group and I_B designates an illuminance by only the lamp in the B group.

Symbol	i_R	i_G	i_B
j	0.78	0.2	0.02
k	0.65	0.2	0.15
l	0.65	0.05	0.3
m	0.55	0.05	0.4
n	0.2	0.4	0.4
e	0.05	0.8	0.15
f	0.18	0.8	0.02

4,138,715

RESONANT SWITCHING CONVERTER

Edward J. Miller, Littleton, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

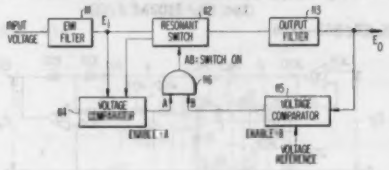
Continuation of Ser. No. 653,996, Jan. 28, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 841,090
Int. Cl.[2] H02M *3/135*
U.S. Cl. 363—28 12 Claims

1. A resonant switching DC to DC converter for providing a DC output voltage to a load, comprising:

a first series resonant circuit including a first inductor and a first capacitor adapted to be constantly connected in series with a source of input voltage, said first inductor forming a charging path for said first capacitor,

a second series resonant circuit including a second inductor and said first capacitor, the natural resonant frequency of said second series resonant circuit being high compared to the natural resonant frequency of said first series resonant circuit so that the current in said first inductor has only a minor effect on the resonant behavior of the current in said second inductor,

first switch means connected in series with said second inductor on the side opposite to said first capacitor for



enabling a discharge path into said load for the charge stored by said first capacitor, and

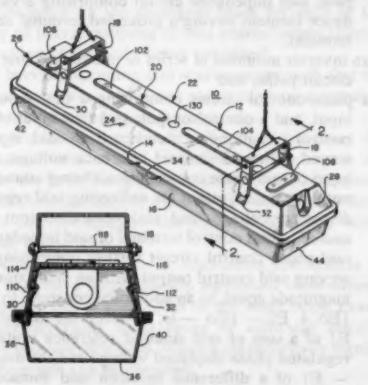
control means for sensing the second series resonant circuit current in said switch means and actuating said switch means when said current is zero.

4,138,716

LIGHTING FIXTURE ENCLOSURE

Richard V. Muhlethaler, Park Ridge, and Richard J. Walls, Geneva, both of Ill., assignors to Arrem Plastics Inc., Addison, Ill.

Filed May 23, 1977, Ser. No. 799,552
Int. Cl.[2] F21V *17/00*
U.S. Cl. 362—375 23 Claims



1. A lighting enclosure comprising:

a plastic housing within which a lighting fixture chassis may be mounted, the housing having downwardly projecting sides, each side having an inwardly opening channel with an inturned lower flange on its lower edge;

a metal lining means generally conforming to the shape of the housing and disposed within the housing;

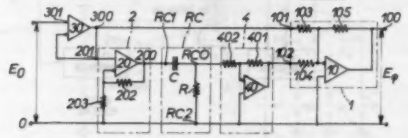
a resilient gasket seated in the inwardly opening channel; and

an upwardly opening lens having inwardly projecting sides, the shape of the lens generally conforming to that of the housing, each of the upwardly projecting sides having out-turned lips, the lips received in the inwardly opening channel and supported on the inturned lower flange, said lens in engagement with the resilient gasket.

4,138,717
CONSTANT-GAIN REGULATED-PHASE STANDARD-PHASE CONVERTER

Daniel Arnoux, Saint Germain en Laye, France, assignor to Societe Chauvin Arnoux, Paris, France

Filed Apr. 1, 1977, Ser. No. 783,803
Claims priority, application France, Apr. 6, 1976, 76 09882
Int. Cl.[2] H02M *5/00*
U.S. Cl. 363—156 **3 Claims**



1. Phase converter for dephasing a sinusoid reference voltage Eo and producing a sinusoid regulated phase displaced voltage Eϕ of same frequency and same magnitude, and having a common point with said sinusoid reference voltage, this phase converter comprising:

an input terminal served with said sinusoid reference voltage,

an output terminal meant for delivering said regulated phase displaced voltage,

a summation circuit having a first input, a second input and an output, said first input of said summation circuit being connected to said input terminal through a first circuit path, said second input of said summation circuit being connected to said input terminal through a second circuit path, and said output of said summation circuit being connected to said output terminal,

a two gain amplifier mounted in series in said second circuit path,

an impedance circuit mounted in series in said second circuit path, said impedance circuit comprising a variable impedance element having a grounded terminal and a control terminal,

an inverter mounted in series in one of said first and second circuit paths, and

a phase-control circuit comprising a first input, a second input, and a control output, said first input of said phase control circuit being connected to said input terminal served with said sinusoid reference voltage, said second input of said phase control circuit being connected to said output terminal meant for delivering said regulated phase displaced voltage, and said control output being connected to said control terminal of said impedance element, said phase control circuit further comprising means for serving said control output with an error signal having a magnitude equal, to an additional constant, to a difference $|Eo + E| - |Eo - E|$ between the magnitude $|Eo + E|$ of a sum of said sinusoid reference voltage and said regulated phase displaced voltage and the magnitude $|Eo - E|$ of a difference between said sinusoid reference voltage and said regulated phase displaced voltage.

4,138,718
NUMERICAL CONTROL SYSTEM WITH DOWNLOADING CAPABILITY

Ronald J. Toke, Bratenahl Village, and William A. Donze, Mentor, both of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Nov. 14, 1977, Ser. No. 850,927
Int. Cl.[2] G06F *3/02, 13/00*
U.S. Cl. 364—200 **9 Claims**

1. A numerical control system, the combination comprising:

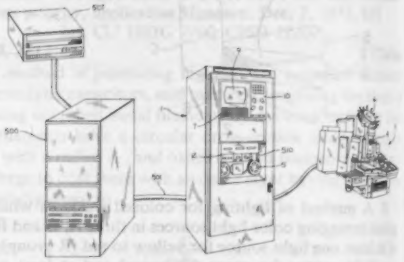
a read/write memory for storing programs including an executive system program;

an N/C processor coupled to said read/write memory by a data bus and an address bus, said N/C processor being operable to write data into said read/write memory through said data bus;

a read-only memory coupled to said N/C processor and storing a resident communications program;

means coupled to said N/C processor for initiating the transfer of said resident communications program from said read-only memory to said read/write memory;

means associated with said N/C processor which is responsive to said initiating means for sequentially transferring each instruction in said resident communications program to said read/write memory and for causing said N/C processor to commence executing said resident communication program;



host processor means coupled to said N/C processor;

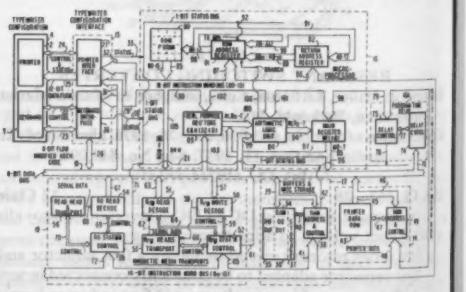
storage means for storing executive system programs for numerical control systems, said storage means being coupled to said host processor to download selected executive system programs to said N/C processor;

wherein said N/C processor is operable in response to said resident communications program to transmit to said host processor a request for a selected executive system program and to receive and store in said read/write memory the downloaded instructions of said selected executive system program.

4,138,719
AUTOMATIC WRITING SYSTEMS AND METHODS OF WORD PROCESSING THEREFOR

H. Wallace Swanstrom; Kenneth C. Campbell, and Werner Schaer, all of Dallas, Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1975, Ser. No. 622,780
Claims priority, application United Kingdom, Nov. 11, 1974, 48626/74
Int. Cl.[2] G06F *3/12*
U.S. Cl. 364—200 **119 Claims**



1. In an automatic writing system including a keyboard and a printer, each of which is connected to at least a common data bus and a common instruction word bus, the improvement comprising:

selection means at said keyboard for defining designated pitch and proportionally spaced printing modes;

a microprocessor having a plurality of specific print control instructions stored therein at addressable locations, said microprocessor connected to said common instruction word bus and said common data bus; and

a printer data store containing print information corresponding to alphameric information which may be entered at said keyboard, said printer data store being connected to said common data bus and said common instruction word bus and addressable by character information corresponding to alphameric information which may be inserted at said keyboard;

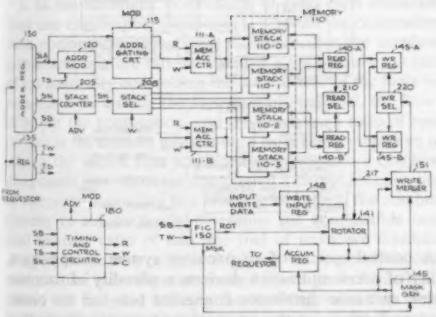
said microprocessor acting in response to the selection of a printing mode of operation and the entry of alphameric information to cause print information corresponding to entered alphameric information to be read from said printer data store and forwarded to said printer.

4,138,720

TIME-SHARED, MULTI-PHASE MEMORY ACCESSING SYSTEM

Ke-Chiang Chu, San Jose, and Richard S. Sharp, Santa Barbara, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 4, 1977, Ser. No. 784,352
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **15 Claims**



1. In a data processing system, the combination comprising:

a memory partitioned into a plurality of individually addressable memory portions, the accessing time of each memory portion requiring at least a plurality of operating cycles of said data processing system;

addressing means responsive to an applied address for initiating accessing of selected locations in a plurality of different memory portions over a plurality of consecutively occurring operating cycles in a manner such that the accessing of only a particular selected one of said memory portions is initiated during an operating cycle;

data accumulation means capable of simultaneously storing data read out from a plurality of said memory portions; and

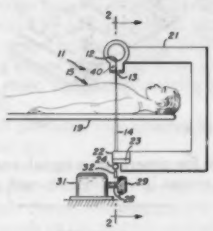
memory output means operative during a read operation for receiving data read out from each addressed selected location of a memory portion as it becomes available and operative during each of a plurality of said operating cycles for storing a predetermined portion of the received data from a selected one of said memory portions in a different designated location of said accumulator means until all of the predetermined portions of the received data read out from the addressed selected locations of said memory are simultaneously stored in said accumulator means.

4,138,721

LIMITED SCAN ANGLE FAN BEAM COMPUTERIZED TOMOGRAPHY

Douglas P. Boyd, Woodside, Calif., assignor to Board of Trustees of The Lelane Standard Junior University, Stanford, Calif.

Filed Nov. 11, 1976, Ser. No. 741,128
Int. Cl.[2] G01M *23/00*
U.S. Cl. 364—414 **30 Claims**



1. An apparatus for examining a region of the interior of a body using penetrating radiation comprising:

source means for directing a divergent beam of penetrating radiation through the region of the body to be examined, said penetrating radiation being directed through the region of the body over a plurality of divergent paths for a given position of said source means relative to the body;

detector means for detecting the transmitted radiation that has passed through the region of the body at a number of positions within the angle subtended by the divergent radiation beam for each of a plurality of lateral positions of said source means relative to the body to thereby provide a set of data corresponding to the transmission of the penetrating radiation at the number of positions within the angle subtended by the divergent beam for each of the plurality of lateral positions of said source means relative to the region of the body being examined;

means for laterally scanning said source means such that the divergent beam is scanned once across the lateral extent of the region of the body being examined;

means for processing the plurality of sets of data from the single lateral scan of said source means relative to the region of the body being examined to provide an attenuation coefficient for each of a plurality of individual matrix elements corresponding to the region of the body being examined; and

means to display the matrix of attenuation coefficients to thereby provide a diagnostically significant three-dimensional tomograph of the region of the body being examined, said divergent beam being of sufficient angular spread to provide data from which a diagnostically significant tomograph can be obtained.

4,138,722

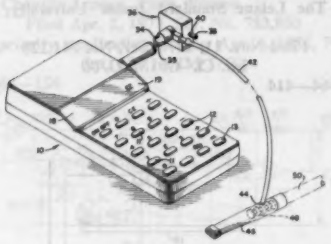
ELECTRONIC AID FOR INHIBITING SMOKING

Robert N. Bonnett, 481 Yorkshire Dr., Severna Park, Md. 21146

Filed Sep. 9, 1977, Ser. No. 832,023
Int. Cl.[2] G06F *7/50*; A24F *13/12*
U.S. Cl. 364—415 **4 Claims**

1. An aid for inhibiting smoking comprising electronic calculator circuitry including a changeable display and repetitively operable switch means, said circuitry being programmed that upon each operation of the switch means the display is

changed by a predetermined constant amount, means directly responsive to a smokers draw-in of smoke from an inhaled



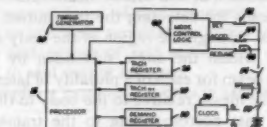
smokers product for generating a signal, and means for operating said switch means in response to each generated signal.

4,138,723

MOTOR VEHICLE SPEED CONTROL SYSTEM

Carl A. Nehmer, Lapeer, and Douglas W. Sweet, Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 12, 1977, Ser. No. 823,920
Int. Cl.[2] G05D *13/58*; B60K *31/00*
U.S. Cl. 364—424 **11 Claims**



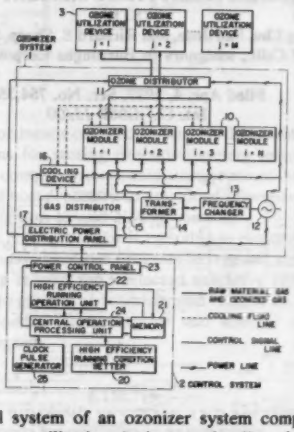
1. A speed control system for a motor vehicle comprising:
speed sensor means producing a pulse train containing sender pulses the frequency of which is related to present vehicle speed,
operator actuable switch means for establishing a cruise mode of operation,
register means including a present speed register, a prior speed register, a set speed register, and a duty cycle register,
processor means responsive to said speed sensor means and said switch means for performing arithmetical operations in a predetermined sequence, said processor means being phased to said sender pulses so that certain of said operations are performed only in response to a sender pulse,
said processor means developing a first binary word related to present vehicle speed in response to each of said sender pulses and loading said first binary word in said present speed register,
said processor means loading a word related to the contents of said present speed register in said set speed register in response to initiation of a cruise mode of operation,
said processor means loading the content of said present speed register in said prior speed register after a number of sender pulses depending on the content of said set speed register whereby the prior speed register is updated at a substantially constant update time,
said processor means processing the contents of said present and prior speed register each update time to obtain a second binary word representing the rate of change of vehicle speed,
said processor means processing the contents of said set speed register and said present speed register each update time to develop a third binary word related to the difference between an actual and a desired speed,
said processor means adding said second binary word to said third binary word and loading a binary word related to the sum of said second and third binary words in said duty cycle register each update time,
means cooperating with said duty cycle register for generating a substantially square wave output signal having a duty cycle related to the content of said duty cycle register, and
throttle actuator means responsive to said output signal for controlling the speed of said vehicle.

4,138,724

CONTROL SYSTEMS OF OZONIZER SYSTEMS

Yasunobu Kawauchi, Fussa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 1, 1977, Ser. No. 773,217
Claims priority, application Japan, Mar. 5, 1976, 51/23794
Int. Cl.[2] G06F *15/46*; C01B *13/10*
U.S. Cl. 364—500 **6 Claims**



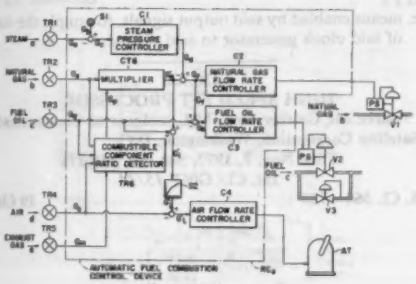
1. A control system of an ozonizer system comprising a plurality of ozone utilization devices; a plurality of ozonizer modules; an ozone distributor connected between the ozone utilization devices and the ozonizer modules for distributing ozone generated by said ozonizer modules among said ozone utilization devices; a raw material gas distributor for supplying raw material gas to said plurality of ozonizer modules; a source of variable voltage for supplying variable operating voltage to respective onozizer modules; a plurality of sensors which sense the operating conditions of respective ozone utilization devices; means responsive to the outputs of said sensors for producing a signal representing the quantity of ozone demanded by said ozone utilization devices; a central operation processing unit of an electronic computer, said central operation processing unit including a first memory device; a primary memory device controlled by said central operation processing unit and connected to receive the output signal of said means producing a signal representing ozone demand; an operation unit controlled by said central operation processing unit for operating on the data stored in said first memory device and said primary memory device; a power control panel connected to receive the output of said operation unit and controlled by said central operation processing unit for generating control signals for controlling the distribution of ozone among said ozone utilization devices, the voltage generated by said source of variable voltage, and the distribution of the raw material gas among said ozonizer modules; and a running condition setter including means for manually selecting the ozone modules and determining a total ozone quantity demanded by said ozone utilization devices which is applied to said primary memory

device, and a clock pulse generator for supplying a clock pulse to said central operation processing unit.

4,138,725
AUTOMATIC FUEL COMBUSTION CONTROL METHOD AND SYSTEM

Zenichi Ikemoto, Akashi, and Masaru Nishimura, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jul. 26, 1977, Ser. No. 819,612
Claims priority, application Japan, Jul. 30, 1976, 51/91506
Int. Cl.[2] G06F *15/20*; F23N *5/00*
U.S. Cl. 364—502 **3 Claims**

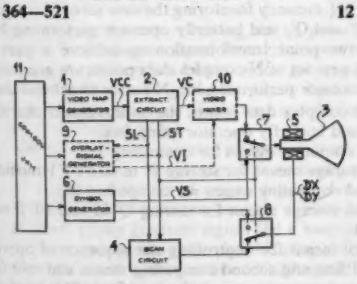


1. In the automatic combustion of fuels each containing at least one combustible component, wherein the composition of each combustible component is known, but the combustible component mixture ratio of one fuel is yet unknown, a method of automatically controlling the combustion of the fuels which comprises: measuring the flow rate of each fuel, the flow rate of air for the combustion, and the percentage ratio of residual oxygen in the exhaust gas resulting from the combustion; introducing the values thus measured as inputs into a combustible component ratio detector comprising a circuit for carrying out an operation according to a reaction formula of the combustion thereby to automatically determine the combustible component mixture ratio of said one fuel of unknown combustible component mixture ratio; multiplying the combustible component mixture ratio thus determined by a signal of the flow rate of said one fuel; and utilizing the resulting value thus obtained by the multiplication for automatic control of the flow rates of said fuels and the flow rate of the air for the combustion.

4,138,726
AIRBORNE ARRANGEMENT FOR DISPLAYING A MOVING MAP

Herve Girault, and Daniel Colas, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 29, 1977, Ser. No. 810,983
Claims priority, application France, Jul. 2, 1976, 76 20256
Int. Cl.[2] G06F *15/50*
U.S. Cl. 364—521 **12 Claims**



1. An airborne display system installed aboard an aircraft for visualizing map sections and air-navigational data in flight, comprising:

a map-signal generator for producing first video signals representing a section of a map of the territory overflown by the aircraft;

scanning means synchronized with said map-signal generator for establishing a succession of frame cycles each divided into a working period and a flyback period;

a source of air-navigational data;

mechanism controlled by said source for varying the map section represented by said first video signals in conformity with the current position of the aircraft;

symbol-generating means connected to said source for producing second video signals representing said air-navigational data;

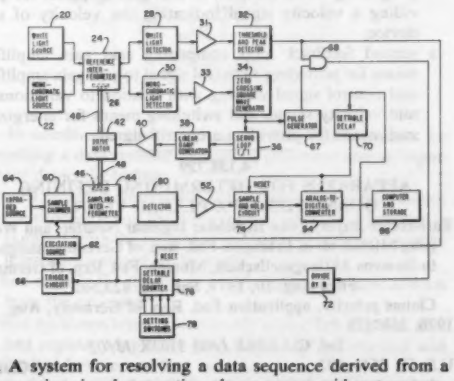
oscilloscope means provided with a screen for the display of said map section; and

switchover means controlled by said scanning means for supplying an input of said oscilloscope means with said first video signals during working periods and with said second video signals during flyback periods of said frame cycles whereby symbolic representations of said air-navigational data are visually superimposed upon said map section on said screen, said oscilloscope means being provided with beam-deflecting means connected to said switchover means for energization in a line-by-line mode from said scanning means during said working periods and in a random-scan mode from said symbol-generating means during said flyback periods.

4,138,727
SYSTEM FOR ANALYZING TIME-DEPENDENT PHENOMENA

Arlan W. Mantz, Acton, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 760,701, Jan. 19, 1977, Pat. No. 4,086,652. This application Oct. 31, 1977, Ser. No. 842,680
Int. Cl.[2] G01V *1/28*; G01B *9/02*
U.S. Cl. 364—525 **8 Claims**



1. A system for resolving a data sequence derived from a time-varying signal-generating phenomenon, said system comprising, in combination:

means for repetitively initiating said phenomenon;

means for detecting signals derived from said phenomenon during the course thereof;

means for sampling said signals during a fixed time increment commencing a predetermined time interval following each initiation of said phenomenon;

means for convolving said sampling of said signals with a transformation;

means for selectively altering the temporal relation between initiation of said phenomenon and convolution of said signals so as to produce a time-ordered set of said samplings in which the sequence of the phenomenon and the

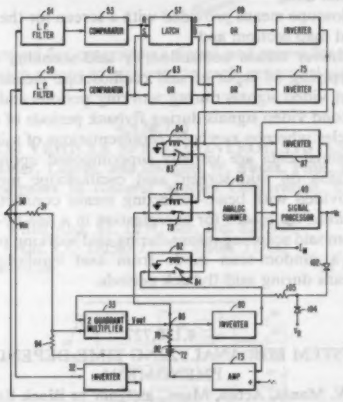
convolution is temporally shifted in successive increments with respect to one another; and

means for combining said samplings according to the order of said set so as to synthesize an interferogram representing the convolution with said transformation of the signals from said phenomenon at said fixed time position.

4,138,728
ELECTRONIC TACHOMETER WITH VARIABLE BANDWIDTH DIFFERENTIATOR

Joseph S. Tung, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,349
Int. Cl.[2] G01P *7/00*; G06G *7/18*
U.S. Cl. 364—565 **7 Claims**



1. An electronic tachometer for sensing position and velocity of a movable device comprising:

a variable gain amplifier;

means for applying a position signal to said gain amplifier;

a first feedback loop comprising said gain amplifier, and an integrating means coupled to said gain amplifier for providing a velocity signal indicating the velocity of said device;

a second feedback loop comprising said gain amplifier, means for providing a control signal to said gain amplifier, said control signal varying with relation to variations of said velocity signal, and switching means for energizing said means for providing a control signal.

4,138,729
APPARATUS FOR DETERMINING DEFINING QUANTITIES OF A PLANAR VECTOR

Karl-Heinz Bayer; Felix Blaschke; Ingemar Neuffer, and Wolfgang Michel, all of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 10, 1977, Ser. No. 823,502
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637175
Int. Cl.[2] G06J *1/00*; H03K *13/02*
U.S. Cl. 364—603 **13 Claims**

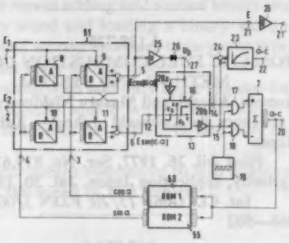
1. In apparatus for determining the defining quantities of a planar vector using a sine and cosine function generator having as inputs the output signal of an integrator, the improvement comprising

a. the integrator being a digital, bidirectional overflow counter;

b. a vector rotator having as inputs two voltages proportional to the orthogonal vector components of the vector to be defined and the outputs of the sine and cosine function generator and having first and second outputs;

c. a clock generator;

d. a three point switching member having said first output as an input to establish response thresholds in proportional dependence on said first output and said second output as a second input, to which it responds to provide output signals; and

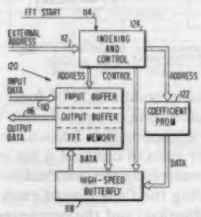


e. means enabled by said output signals, to couple the output of said clock generator to said counter.

4,138,730
HIGH SPEED FFT PROCESSOR

M. Zaheer Ali, Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Nov. 7, 1977, Ser. No. 849,271
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—726 **10 Claims**



1. In an N-point Fast Fourier Transform (FFT) processor of the type having a butterfly operator for performing elemental 2-point transformation defined by the following complex relation

$$P' = P + Q$$

$$Q' = (P - Q) \times W$$

where P and Q are two complex data points spaced from one another by N/2 and W is a complex coefficient in the form

$$e^{\frac{-j2\pi k}{N}}$$

for time domain-to-frequency domain transformation and

$$e^{\frac{j2\pi k}{N}}$$

for frequency domain-to-time domain transformation,

$$0 \leq k < \frac{N}{2},$$

and an FFT memory for storing the new set of N complex data points P' and Q', said butterfly operator performing N/2 elemental two-point transformation to achieve a pass during which a new set of N complex data points are generated, said FFT processor performing $\log_2 N$ passes to achieve an output array of complex data points, the improvement characterized in that said butterfly operator comprises:

first computing means for computing P';

first storage means for storing P' in said FFT memory;

second computing means for computing Q';

second storage means for storing Q' in said FFT memory, and

control means for controlling the sequence of operation at said first and second computing means and said first and second storage means so that said first and second computing means begin computing a present pair of points P' and Q' substantially simultaneously and said first computing

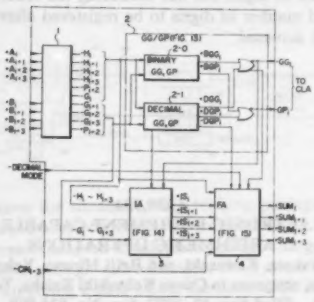
means finishes first, said first storage means storing the present P' in said FFT memory, and said first and second computing means beginning computation of a new set of points P' and Q' while said second computing means finishes computation of the present Q'.

4,138,731

HIGH SPEED BINARY AND BINARY CODED DECIMAL ADDER

Shigemi Kamimoto; Toshio Hayashi, both of Kawasaki, and Kazuyuki Shimizu, Machida, all of Japan, assignors to Fujitsu Limited, Japan

Filed Dec. 9, 1977, Ser. No. 359,184
Claims priority, application Japan, Dec. 30, 1976, 51-159210
Int. Cl.[2] G06F *7/50*
U.S. Cl. 364—783 **1 Claim**



1. A high speed binary and binary coded decimal adder for selectively performing one of either the binary addition of binary coded decimal addition of two numbers and comprising a plurality of partial adders and a carry look ahead circuit;

each of said plurality of partial adders being supplied with an augend input and an addend input and a carry input;

each of said plurality of partial adders supplying at least a group generate signal and a group propagate signal to said carry look ahead circuit;

each of said plurality of partial adders comprising: a half adder element receiving said augend and addend inputs, a binary mode carry look ahead input signal generator circuit element connected to its respective half adder element, a binary coded decimal mode carry look ahead input signal generator circuit element connected to its respective half adder element, an intermediate adder element connected to its respective half adder element and both the binary and binary coded decimal mode carry look ahead input signal generator circuit elements, and a full adder element connected to the other elements comprising its respective partial adder;

each of said half adder elements generating a bit generate signal and a bit propagate signal based on each bit of the augend input and the addend input inputted to the half adder element;

each of said binary mode carry look ahead input signal generator circuit elements receiving the bit generate signal and the bit propagate signal from its respective half adder element to provide a binary mode group generate signal and a binary mode group propagate signal during the binary mode of operation of said high speed binary and binary coded decimal adder;

each of said binary coded decimal mode carry look ahead input signal generator circuit elements receiving the bit generate signal and the bit propagate signal from its respective half adder element to provide a binary coded decimal mode group generate signal and a binary coded decimal mode group propagate signal during the binary coded decimal mode operation of said high speed binary and binary coded decimal adder;

each of said intermediate adder elements receiving at least the bit generate signal, the bit propagate signal, and the binary coded decimal mode group generate signal from its respective half adder and binary coded decimal mode carry look ahead input signal generator elements to selectively perform one of either a binary addition or binary coded decimal addition of said augend and addend inputs to its respective partial adder regardless of the carry inputs thereto to produce an intermediate sum of said augend and addend inputs;

each of said full adder elements receiving and correcting the intermediate sum of its respective intermediate adder element with a carry input supplied to the least significant bit position of its respective partial adder from the carry look ahead circuit; and

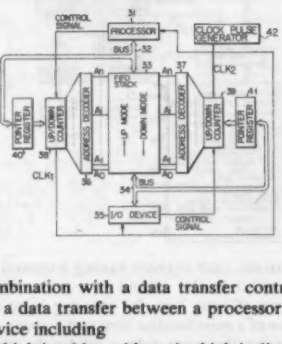
each of said partial adders supplying as its group generate signal to the carry look ahead circuit, a signal comprising the logical sum of its binary mode group generate signal and its binary coded decimal mode group generate signal, and supplying as its group propagate signal to the carry look ahead circuit, a signal comprising the logical sum of its binary mode group propagate signal and its binary coded decimal mode group propagate signal.

4,138,732

DATA TRANSFER CONTROL SYSTEM

Seigo Suzuki, and Keiji Uemori, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 27, 1976, Ser. No. 735,961
Claims priority, application Japan, Oct. 31, 1975, 50-131174
Int. Cl.[2] G06F *13/00*; G11C *19/00*
U.S. Cl. 364—900 **4 Claims**



1. In combination with a data transfer control system for controlling a data transfer between a processor and an input-/output device including

a stack which is addressable and which is disposed between the processor and the input/output device to permit data supplied from the processor and input/output device to be temporarily stored in the stack;

a first register for storing an initial address and final address from the processor;

a first up/down counter connected to the first register, said first register adapted to load said initial address and said final address in said first counter;

a clock pulse generator for sequentially supplying first clock signals to said first up/down counter, whereby said first up/down counter begins a count-up or count-down operation in response to a count-up or count-down control signal applied from the processor and, during the count-up or count-down operation, delivers an output signal for each sequential first clock signal for designating an address of the stack; and

a first address decoder connected to the first counter for decoding each output signal of the first counter and designating the corresponding address at the stack;

the improvement providing bidirectional transfer of information through the stack comprising;

a second register for storing an initial address and final address from the input/output device;

a second up/down counter connected to the second register, said second register adapted to load said initial address and final address from the input/output device in said second counter, said clock pulse generator sequentially applying second clock signals to said second up/down counter, whereby said second up/down counter begins a count-up or count-down operation in response to a count-up or count-down control signal applied from the input/output device and, during the count-up or count-down operation, delivers an output signal for each sequential second clock signal for designating an address of the stack; and

a second address decoder connected to the second counter for decoding each output signal of the second counter and designating the corresponding address at the stack.

4,138,733

ELECTRONIC CASH REGISTER

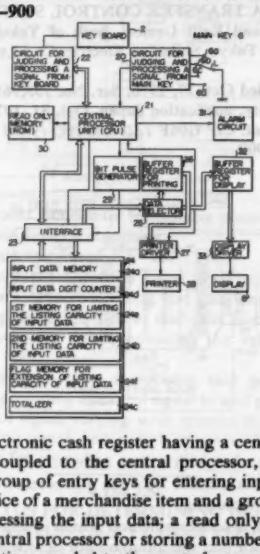
Yuji Tadakuma; Syunji Saito, and Toru Eguchi, all of Ohito, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 27, 1977, Ser. No. 801,327

Claims priority, application Japan, May 28, 1976, 51-62022

Int. Cl.[2] G07G *1/00*; G06F *3/02, 15/20*

U.S. Cl. 364—900 **2 Claims**


KEY BOARD
MAIN KEY 6
CIRCUIT FOR JUDGING AND PROCESSING A SIGNAL FROM KEY BOARD
CIRCUIT FOR JUDGING AND PROCESSING A SIGNAL FROM MAIN KEY
READ ONLY MEMORY (ROM)
CENTRAL PROCESSOR UNIT (CPU)
ALARM CIRCUIT
INT. PULSE GENERATOR
BUFFER REGISTER FOR PRINTING
BUFFER REGISTER FOR DISPLAY
DATA SELECTOR
INTERFACE
PRINTER DRIVER
DISPLAY DRIVER
INPUT DATA MEMORY
INPUT DATA DIGIT COUNTER
1ST MEMORY FOR LIMITING THE LISTING CAPACITY OF INPUT DATA
2ND MEMORY FOR LIMITING THE LISTING CAPACITY OF INPUT DATA
FLAG MEMORY FOR EXTENSION OF LISTING CAPACITY OF INPUT DATA
TOTALIZER
PRINTER
DISPLAY

1. In an electronic cash register having a central processor; a keyboard coupled to the central processor, the keyboard including a group of entry keys for entering input data representing the price of a merchandise item and a group of function keys for processing the input data; a read only memory coupled to the central processor for storing a number of programs; a memory section coupled to the central processor, the memory section including an input data memory for temporarily storing the input data, a low digit number memory having a value corresponding to a first predetermined number of digits stored therein, a counter for counting the digits of an input data item and a totalizer for accumulating the input data; a first prohibiting means coupled to the counter and to the low number memory for prohibiting the registration of an input data item formed of digits exceeding the first predetermined number of digits, by comparing the count of the counter with the value corresponding to the first predetermined number of digits stored in the low digit number memory; and printing means coupled to the central processor and to the memory section for printing on a printing paper the input data stored in the input data memory and the total of the input data accumulated in the totalizer;

the improvement:

wherein said electronic cash register further includes registering means for permitting the registration of at least one of specific input data item formed of digits exceeding said first predetermined number of digits, said registering means including a release key provided on said keyboard; and further comprising:

a high digit number memory provided in said memory section and having stored therein a value corresponding to a second predetermined number of digits larger than the first predetermined number;

means coupled to the first prohibiting means for releasing said first prohibiting means when the release key is actuated; and

a second prohibiting means coupled to the counter and to the high digit number memory for prohibiting the registration of the specific input data formed of digits exceeding the second predetermined number of digits, by comparing the count of the counter with the value corresponding to the second predetermined number of digits stored in the high digit number memory,

thereby permitting at least one of the specific input data items formed of digits exceeding the first predetermined number of digits but not exceeding the second predetermined number of digits to be registered after the release key is actuated.

4,138,734

ELECTRONIC EQUIPMENT CAPABLE OF ARITHMETIC OPERATIONS

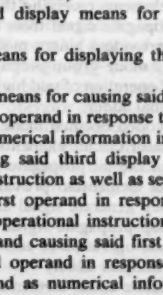
Shinichi Nakata, Kawasaki, and Reiji Hirano, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1977, Ser. No. 834,809

Claims priority, application Japan, Oct. 1, 1976, 51-118333; Oct. 1, 1976, 51-118334; Oct. 8, 1976, 51-121063; Oct. 8, 1976, 51-121064; Oct. 13, 1976, 51-122545; Nov. 5, 1976, 51-132820

Int. Cl.[2] G06F *15/02, 3/14*

U.S. Cl. 364—710 **14 Claims**



1. Electronic equipment for handling numerical information comprising:

numeral input means for entering numerical information;

instruction input means for entering an operational instruction;

execution directing means for directing the execution of the operational instruction;

first and second display means for displaying numerical information;

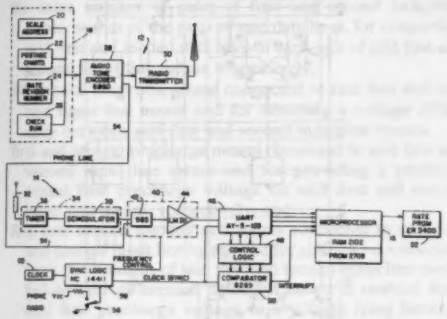
third display means for displaying the operational instruction; and

display control means for causing said first display means to display a first operand in response to the entry of the first operand as numerical information into said numeral input means, causing said third display means to display an operational instruction as well as second display means to display the first operand in response to the subsequent entry of the operational instruction into said instruction input means, and causing said first display means to display a second operand in response to the entry of the second operand as numerical information into said numeral input means.

4,138,735
SYSTEM FOR REMOTELY RESETTING POSTAGE RATE MEMORIES

Michael A. Allocca, Fairfield, and Gregory M. Cinque, Stamford, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 31, 1977, Ser. No. 764,054
Int. Cl.[2] G06F *3/04, 15/20*; G01G *23/42*
U.S. Cl. 364—900 10 Claims



1. A system for simultaneously revising postage rate data carried in a plurality of memories associated with a like plurality of processors adapted to calculate postage charges pursuant to a revisable postage rate structure, the system comprising means for supplying a data block, the data block including an encoded postage rate memory revision data signal, a remote location address signal and a rate revision designation signal, means for modulating a carrier wave with the data block, means for transmitting the modulated carrier wave from a first location, the memories and processors being positioned at a plurality of locations remote from the first location, carrier wave receiving means at each remote location, decoding means connected to each receiving means, the decoding means receiving the data block and in response thereto providing a corresponding data block signal, means disposed at each remote location receiving the data block signal and segregating the address signal from the postage rate data signal and the rate revision designation signal, means at each remote location receiving the address signal and comparing such address signal with a preset address signal and in response to the equality thereof providing a comparison signal, each processor receiving the comparison signal and in response thereto accepting the postage rate data signal, receiving the rate revision designation signal, said processor including means for supplying an incremented rate revision designation signal and for comparing the received designation signal with said incremented rate revision designation signal, and in response to the equality thereof entering the accepted postage rate data signal into each memory for subsequent recall during the postal calculation computations in accordance with the revised postage rate structure.

4,138,736
ONE LEVEL SWITCH FOR MAGNETIC BUBBLE DOMAIN DEVICES

Peter K. George, Morgan Hill, and Tsutomu Kobayashi, Placentia, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 28, 1977, Ser. No. 820,079
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—12 10 Claims

1. A one-level switch for magnetic bubble domain devices comprising,

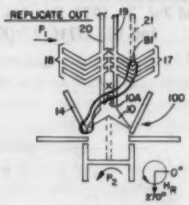
first and second propagation paths adjacent to each other,

a transfer element included in said first propagation path and adjacent said second propagation path, and

said transfer element includes two arms joined together at approximately a 90° angle to each other,

each of said arms of said transfer element taper to a narrower dimension at the free ends thereof,

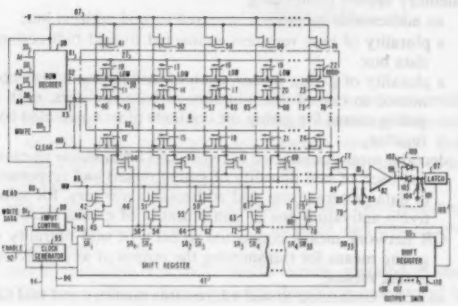
a pair of conductor elements integrally formed with said transfer element and components in said second propagation path to permit current signals to be applied relative to said first and second propagation paths so that magnetic bubble domains can interact between said first and second propagation paths.



4,138,737
NON-VOLATILE MEMORY WITH IMPROVED READOUT

David H. McCann, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 8, 1978, Ser. No. 884,530
Int. Cl.[2] G11C *21/00*
U.S. Cl. 365—78 7 Claims



7. An electrically alterable non-volatile memory for storing information comprising:

an array of electrically alterable non-volatile memory elements arranged in a plurality of rows and columns,

means for selecting one of said rows in said array in response to address signals,

means for writing predetermined information into a first bit and for writing information into at least a second and third bit of a selected row,

means for reading information from at least said second and third bits of selected row including means for comparing said first bit with said second bit,

first means for storing a predetermined first value when the voltage difference between said first and second bit exceed a predetermined value and for storing a predetermined second value when the voltage difference between said first and second bit is less than said predetermined value,

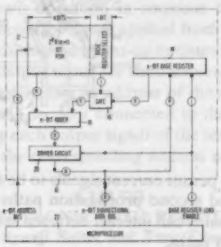
means for comparing said second bit with said third bit, and

second means for changing said value stored by said first means for storing to said other value when the voltage difference between said second and third bit exceed said predetermined value.

4,138,738
SELF-CONTAINED RELOCATABLE MEMORY SUBSYSTEM

Daniel P. Drogichen, B1 Magdalene House, 500 W. Rosedale Ave., West Chester, Pa. 19380

Filed Jul. 24, 1978, Ser. No. 927,559
Int. Cl.[2] G11C *17/00*
U.S. Cl. 365—94 27 Claims



1. A self-contained relocatable memory system for use with a digital microprocessor, said digital microprocessor providing an a-bit address bus for specifying an address corresponding to a location to be read from said memory system, an n-bit bidirectional data bus for transferring data between said microprocessor and said memory system and a plurality of control signals for controlling the transfer of n-bit data constants from said microprocessor to said memory device, said microprocessor characterized as having an n-bit instruction format, said memory system comprising:

an addressable memory connected to said address bus;

a plurality of base registers connected to said bidirectional data bus;

a plurality of gating means, each of said gating means connected to one of said plurality of base registers, each of gating means for gating the contents of its connected base register;

decoder means connected between said addressable memory and each of said plurality of gating means and responsive to data patterns from said addressable memory, for selectively activating one of said plurality of gating means;

OR network means connected to each of said plurality of gating means for transmitting the output of said activated gating means;

an adder connected to said addressable memory and said OR network means; and

driver means connected to the output of said adder and said bidirectional data bus for transmitting the output of said adder to said microprocessor.

4,138,739
SCHOTTKY BIPOLAR TWO-PORT RANDOM-ACCESS MEMORY

Barry J. Robinson, Mountain View, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Continuation of Ser. No. 714,535, Aug. 16, 1976, abandoned.
This application Oct. 31, 1977, Ser. No. 846,479
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—174 8 Claims

1. A two-port random-access memory (i.e., RAM) cell comprising:

first and second NPN transistors, the emitters of said transistors being coupled together, the base of said first transistor being coupled to the collector of said second transistor, the base of said second transistor being coupled to the collector of said first transistor;

first and second resistors respectively coupled between a positive potential current source and the collectors of said first and second transistors;

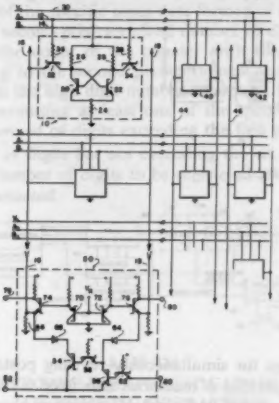
a third resistor coupled between the intercoupled emitters of said first and second transistors and ground reference;

fourth and fifth resistors;

first and second select line conductors;

first and second digit line conductors;

a third NPN transistor for signalling the state of the RAM cell into said first digit line conductor, the collector of said third transistor being coupled to the collector of said first transistor, the emitter of said third transistor being coupled to said first digit line conductor, and the base of said



third transistor being coupled through said fourth resistor to said first select line conductor; and

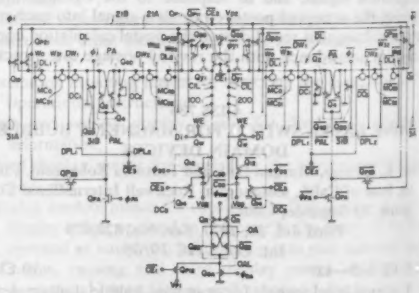
a fourth NPN transistor for signalling the state of the RAM cell into said second digit line conductor, the collector of said fourth transistor being coupled to the collector of said second transistor, the emitter of said fourth transistor being coupled to said second digit line conductor, and the base of said fourth transistor being coupled through said fifth resistor to said second select line conductor;

said third and fourth transistors also operable for changing the state of the RAM cell.

4,138,740
MEMORY SYSTEM

Kiyoo Itoh, Higashi-kurume, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 15, 1978, Ser. No. 886,759
Claims priority, application Japan, Mar. 25, 1977, 52-32188
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—203 21 Claims



1. A memory system comprising:

a plurality of pairs of first and second data lines,

a plurality of word lines which are disposed in a manner to intersect with said plurality of pairs of data lines,

a plurality of memory cells for storing either of two different

signals, each of which is disposed at a point of intersection of respective one of said plurality of pairs of data lines and respective one of said plurality of word lines, is connected to said respective data line and said respective word line, and generates either of two different voltage signals corresponding to the stored signals onto said respective one data line in response to a signal on said respective one word line,

first and second input line means,

the same number of pairs of first and second switching means as that of the pairs of said data lines, for connecting said first and second data lines of each pair of said first and second input line means, respectively,

differential detection means connected to said first and second input line means and for detecting a voltage difference between said first and second input line means,

first and second precharge means connected to said first and second input line means and for providing a predetermined first precharge voltage on said first and second input line means, respectively, and

first and second dummy cell means connected to said first and second input line means and for shifting on a selective basis the voltages of said first and second input line means before said differential detection means is enabled from said first precharge voltage to a voltage lying between two voltages which said second and first input line means can take in response to said different signals from one of said memory cells, respectively.

4,138,741

DISC ECCENTRICITY COMPENSATING SYSTEM

Lee V. Hedlund, Cinnaminson, and Arch C. Luther, Woodstown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,475

Claims priority, application United Kingdom, Mar. 19, 1976, 11119/76

Int. Cl.[2] **G11B** *7/00*

U.S. Cl. 365—234 **6 Claims**

1. Information recording and playback apparatus, for use with a disc record medium, comprising:

turntable means for supporting said disc record medium and for providing a given rotational rate of speed to said disc record medium;

means for effecting recording, on said disc medium, of a continuous information segment along successive, spaced elongated tracks and

for effecting recording, on said disc medium, of an additional, continuous information segment;

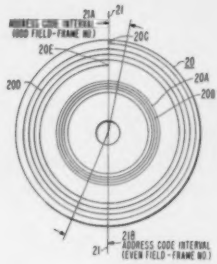
means for tracking one of the existing elongated information tracks and for providing a first information signal in response to said tracking;

means for deriving, from said tracking means, a second information signal which accords with the track position profile of the information track subjected to tracking, said deriving means including a constant frequency signal generator and a comparator, said comparator comparing said constant frequency signal and said first information signal for providing said second information signal in response to differences in the frequencies of the compared signals;

a first switch means, connected between said constant frequency signal generator and said recording means, operable in either a passing or a blocking mode;

a second switch means, connected between said deriving means and said recording means, operable in either a passing or a blocking mode;

said first and second switch means being operated in respective blocking modes during recording and operated in respective passing modes during tracking;



a memory means;

a third switch means operable in a first and a second condition, said third switch means being connected between said deriving means and said memory means, said first condition permitting said second information signal to be stored in said memory means;

said memory means being operated at a rate corresponding to said given rotational rate of speed of said disc record medium;

means, including said third switch means operated in said second condition, for recovering the information stored in said memory means; and

means, responsive to the output of said information recovering means, for recording said additional information segment along additional successive, spaced elongated tracks each having a track position profile which substantially accords with the track position profile of the information track subjected to tracking.

DESIGN PATENTS

GRANTED FEB. 6, 1979

ERRATA

The CLASS	PATENT NO.
D99–001	221,023
D18–015	221,023

DESIGNS

FEBRUARY 6, 1979

250,976

LACED OPEN TOE WEDGIE SNEAKER

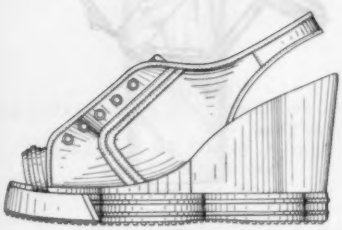
Norman H. Finn, Waban, Mass., assignor to The United States Shoe Corporation, Cincinnati, Ohio

Filed Nov. 2, 1977, Ser. No. 848,373

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—286



250,977

INVALID CHAIR

Richard J. Powers, 3622 Milford Mill Rd., Baltimore, Md. 21207

Filed Feb. 16, 1977, Ser. No. 769,408

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—22

250,978

ARMCHAIR OR THE LIKE

Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015

Filed Jan. 12, 1977, Ser. No. 758,688

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—68

250,979

SEAT

Harold Glaser, St. Louis County, Mo., assignor to James David Incorporated, Maryland Heights, Mo.

Filed Mar. 30, 1977, Ser. No. 782,943

The portion of the term of this patent subsequent to Mar. 28, 1992, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—73

250,980

SEAT

Harold Glaser, St. Louis County, Mo., assignor to James David Incorporated, Maryland Heights, Mo.

Filed Mar. 30, 1977, Ser. No. 782,983

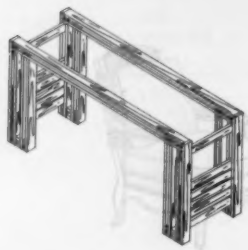
The portion of the term of this patent subsequent to Mar. 28, 1992, has been disclaimed.

Term of patent 3½ years

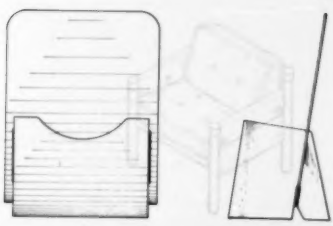
Int. Cl. D6—*01*

U.S. Cl. D6—73

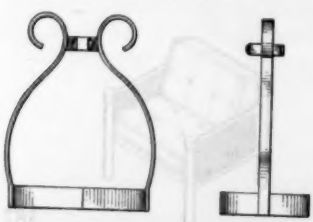
250,981
SUPPORT FOR USE WITH ELECTRONIC COMPUTER UNITS
David A. O'Connor, Virginia Beach, Va., assignor to Virginia National Bankshares, Inc.
Division of Ser. No. 669,604, Mar. 23, 1976. This application Feb. 24, 1978, Ser. No. 880,978
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



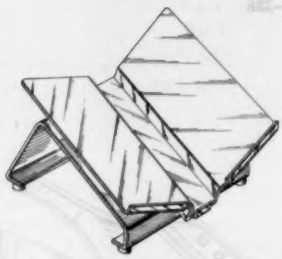
250,982
LITERATURE HOLDER
Harry S. Gilman, Marblehead, Mass., assignor to Crown Plastics Corp., Boston, Mass.
Filed Nov. 2, 1977, Ser. No. 848,020
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—180



250,983
SUPPORT STAND FOR A BOTTLE
William J. Tobin, 315 W. 87th St., New York, N.Y. 10024
Filed May 18, 1977, Ser. No. 798,258
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—181



250,984
BOOK STAND
Joseph Schwartz, 841A Heritage Village, Southbury, Conn. 06488
Filed May 30, 1978, Ser. No. 910,655
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—184

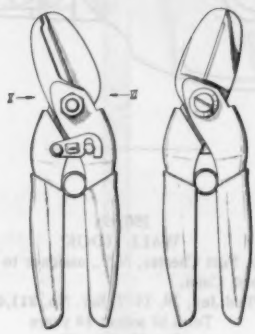


250,985
PILLOW
Nolen L. Armstrong, 3131 NW. Expressway, Oklahoma City, Okla. 73112
Filed Oct. 13, 1976, Ser. No. 732,061
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201

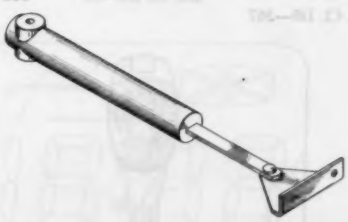
250,986
TUMBLER OR SIMILAR ARTICLE
James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Apr. 15, 1977, Ser. No. 787,917
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—15

250,987
COVERED STORAGE CONTAINER
Alvin J. Stahel, Brighton, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Feb. 6, 1976, Ser. No. 655,943
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—76

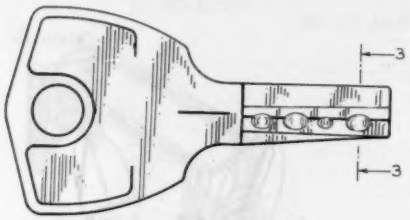
250,988
PAIR OF SECATEURS
Frederick W. Plimmer, South Glamorgan, Wales, assignor to Wilkinson Sword, Ltd.
Division of Ser. No. 712,316, Aug. 6, 1976. This application May 30, 1978, Ser. No. 910,622
Claims priority, application United Kingdom, Feb. 6, 1976, 974376
Term of patent 14 years
Int. Cl. 8—*03*
U.S. Cl. D8—5



250,989
STRUT
Louis R. Csokasy, Bristol, and Steve A. Spretnjak, Elkhart, both of Ind., assignors to Excel Industries, Inc., Elkhart, Ind.
Filed Jan. 10, 1977, Ser. No. 758,157
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—330



250,990
KEY
Robert H. Hanneman, Franklin, and Kenneth N. Grandy, South Milwaukee, both of Wis., assignors to Master Lock Company, Milwaukee, Wis.
Filed Mar. 30, 1977, Ser. No. 782,717
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—347



250,991
WALL HOOK
Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jun. 29, 1977, Ser. No. 811,451
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

250,992
WALL HOOK
Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jun. 29, 1977, Ser. No. 811,452
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

250,993
WALL HOOK
Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jun. 29, 1977, Ser. No. 811,453
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

250,994
WALL HOOK
Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jun. 29, 1977, Ser. No. 811,455
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

250,995
BOTTLE
Theodore L. Beaver, Roselle, Ill., assignor to The Clorox Company, Oakland, Calif.
Filed Sep. 7, 1976, Ser. No. 720,794
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—39

250,996

DISPLAY CARD FOR EARRINGS OR THE LIKE

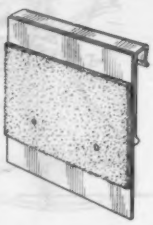
Murray J. Glaser, Woodmere, N.Y., assignor to Monet Jewelers, Inc., New York, N.Y.

Filed Oct. 5, 1977, Ser. No. 840,090

Term of patent 14 years

Int. Cl. D9—*99*

U.S. Cl. D9—191



250,997

THERMOCHROMIC THERMOMETER

Winfried Schuberth, Dayton, Ohio, assignor to American Thermometer Co., Inc., Dayton, Ohio

Filed Jan. 10, 1977, Ser. No. 757,963

Term of patent 14 years

Int. Cl. D10—*04*

U.S. Cl. D10—57

250,998

VOLUME REDUCTION SCALE

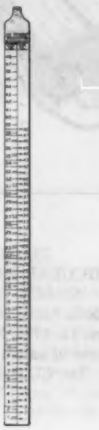
William N. Breece, c/o R. O. Biederman, 1263 Golden Lake Rd., Fort Meyers, Fla. 33905

Filed Jan. 21, 1977, Ser. No. 760,837

Term of patent 14 years

Int. Cl. D10—*04*

U.S. Cl. D10—71



250,999

DIGITAL WATCH DIAL

Susumu Karibe; Midori Miyata, and Eichi Osawa, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

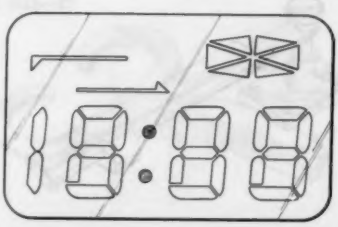
Filed Nov. 26, 1976, Ser. No. 745,373

Claims priority, application Japan, May 28, 1976, 51-19871

Term of patent 14 years

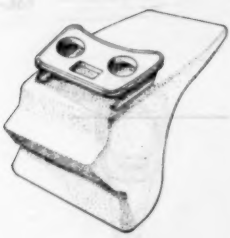
Int. Cl. D10—*07*

U.S. Cl. D10—125

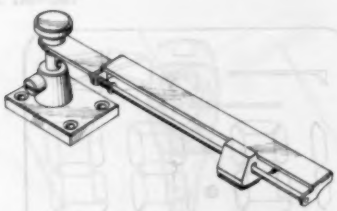


251,000
SLED OR SIMILAR ARTICLE
Donald A. Cournoyer, 30 Ledge St., Nashua, N.H. 03060
Filed Apr. 18, 1977, Ser. No. 788,156
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—11

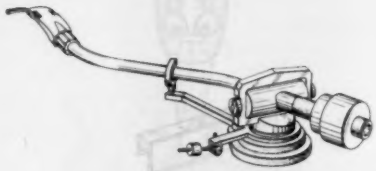
251,001
COMBINED VEHICULAR RADIO MOUNTING AND SNACK TRAY
Frank Forselius, 12924 S. Main St., Los Angeles, Calif. 90061
Filed Nov. 12, 1976, Ser. No. 741,481
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



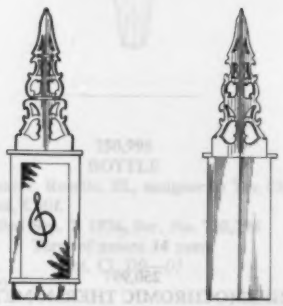
251,002
CLEANING ARM FOR PHONOGRAPH RECORDS
Masao Okada, Yokohama, Japan, assignor to Excel Sound Corporation, Tokyo, Japan
Filed Jun. 28, 1976, Ser. No. 700,240
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—25



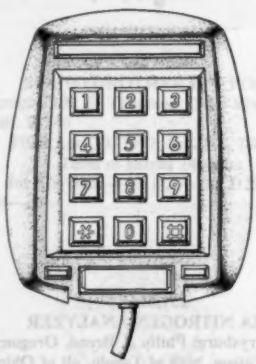
251,003
TONE ARM
Kazuhito Ohtomo, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Apr. 5, 1977, Ser. No. 784,867
Claims priority, application Japan, Nov. 19, 1976, 51-45726
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—27



251,004
POLYGONAL SPEAKER ENCLOSURE
Tony Bubash, 102, E. Conan St., Ely, Minn. 55731
Filed Apr. 19, 1977, Ser. No. 788,888
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33



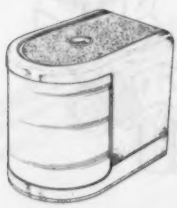
251,005
TELEPHONE INSTRUMENT
Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Oct. 18, 1976, Ser. No. 733,367
Claims priority, application Sweden, Apr. 22, 1976, 760888
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



251,006
HOUSING FOR RADIO RECEIVER COMPONENTS OR THE LIKE
James E. Whitesel, 5313 Grand Ave., Western Springs, Ill. 60558
Filed Jun. 25, 1976, Ser. No. 699,887
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

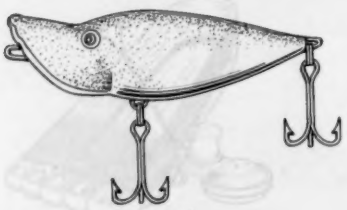
251,007
FLOOR MACHINE
Jack L. Burgoon, Toledo, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed May 2, 1977, Ser. No. 793,153
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—50

251,008
ELECTRIC PENCIL SHARPENER
Daisuke Kajiwara, Onojo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed May 4, 1977, Ser. No. 793,895
Claims priority, application Japan, Jan. 27, 1977, 52-2458
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—73

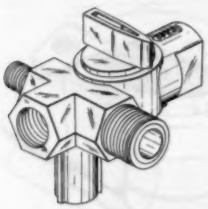


251,009
FISH LURE
Harvey D. Stutzman, 71954 County Rd. 100, Nappanee, Ind. 46550
Filed Apr. 10, 1978, Ser. No. 894,983
Term of patent 3½ years
Int. Cl. D22—*05*
U.S. Cl. D22—27

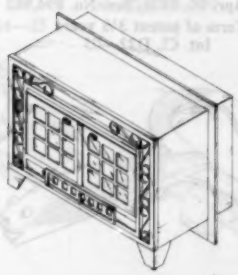
251,010
FISHING LURE
John W. Edmondson, Rte. 3, Box 584, Spring City, Tenn. 37381
Filed May 2, 1977, Ser. No. 793,156
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



251,011
COMBINED AIR COMPRESSOR TANK MANIFOLD AND VALVE
Joseph L. Krechel, Ladue, and Michael J. Purvis, Maplewood, both of Mo., assignors to Control Devices, Incorporated, St. Louis, Mo.
Filed Nov. 26, 1976, Ser. No. 745,010
Term of patent 7 years
Int. Cl. D23—*01*
U.S. Cl. D23—20

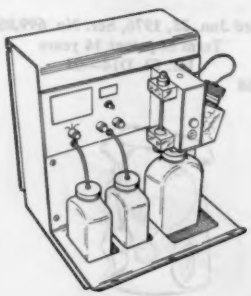


251,012
FIREPLACE HEATER
John T. Owen, Jr., 404 East St., SE., Vienna, Va. 22180
Filed Aug. 24, 1977, Ser. No. 827,262
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

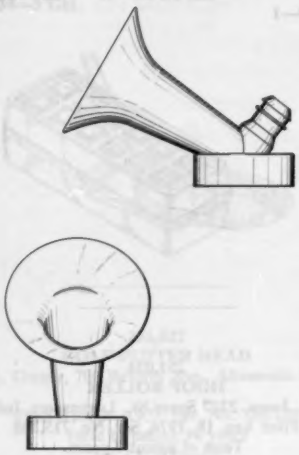


251,013
DISPOSABLE LOOP AND COLLECTOR FOR TRANSFERRING BIOLOGICAL SAMPLES
Stanley Kettel, 20 Honey Close, Beehive La., Chelmsford, Essex, England
Filed Dec. 13, 1977, Ser. No. 860,049
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8

251,014
UREA NITROGEN ANALYZER
Robert J. Aul, Perrysburg; Philip J. Breno, Oregon; Wayne J. Zitkus; Barry Watson, both of Toledo, all of Ohio, and Paul R. Maguire, Los Angeles, Calif., assignors to Owens-Illionis, Inc., Toledo, Ohio
Continuation-in-part of Ser. No. 604,504, Aug. 13, 1975, abandoned. This application Aug. 25, 1976, Ser. No. 717,776
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—21

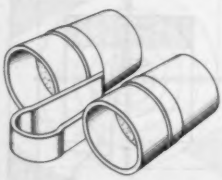


251,015
BREAST PUMP
Richard E. Cone, 249 Bowman Dr., Kent, Ohio 44240
Filed Feb. 17, 1978, Ser. No. 878,931
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—23

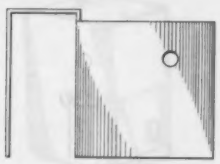


251,016
SPA HYDROTHERAPY POOL
John W. Stangle, 100 E. Thousand Oaks Blvd., 225 Thousand Oaks, Calif. 91360
Filed Apr. 18, 1977, Ser. No. 788,131
Term of patent 14 years
Int. Cl.[2] D24—*99;* D23—*02;* D25—*99*
U.S. Cl. D24—38

251,017
NASAL DEVICE
Saul O. Amezcua, Mazatlan #118, Condesa Colony, Mexico City 11, Mexico
Filed Jan. 28, 1977, Ser. No. 763,357
Term of patent 14 years
Int. Cl. 24—*99;* 29—*02*
U.S. Cl. D24—99



251,018
SAWHORSE TABLE CONVERSION BRACKET
Cecil W. Lockwood, 2311 N. 19th St., Lawton, Okla. 73501
Filed Dec. 22, 1976, Ser. No. 752,883
Term of patent 14 years
Int. Cl. D8—*08, 09*
U.S. Cl. D25—68

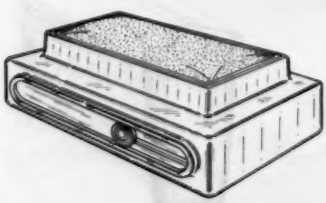


251,019
ROADWAY EXPANSION JOINT SEALING RETAINER EXTRUSION
John F. Brady, Wood Dale, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.
Filed Jan. 7, 1977, Ser. No. 757,478
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

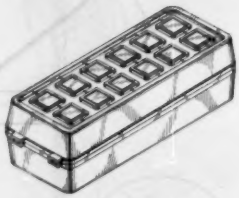
251,020
GAS LIGHTER
Alfred Racek, Seitenberggasse 54, 1160 Vienna, Austria (1160)
Filed Dec. 28, 1976, Ser. No. 754,993
Claims priority, application Austria, Aug. 16, 1976, 507801/76
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

251,021
BIRD FEEDER
Morton L. Blasbalg, 26 Sandro Dr., Warwick, R.I. 02886
Filed Nov. 16, 1977, Ser. No. 851,979
Term of patent 14 years
Int. Cl.[2] D30—*03*
U.S. Cl. D30—15

251,022
GROOMING BRUSH FOR PETS
Nicholas D. McKay, Grand Blanc, Mich., assignor to Helmac Products Corporation, Flint, Mich.
Filed Oct. 21, 1976, Ser. No. 734,501
Term of patent 14 years
Int. Cl. D30—*99*; D4—*01, 02*
U.S. Cl. D30—40

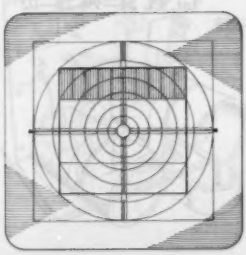


251,023
BURIAL VAULT
Wyoming B. Paris, 2254 N. Yale, Wichita, Kans. 67220, and Robert J. Smith, 8713 W. St. Joe Hwy., Lansing, Mich. 48917
Filed Jan. 24, 1977, Ser. No. 761,592
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D99—1



251,024
HOOP ROLLER
Raymond W. Jones, 2227 Spear St., Logansport, Ind. 46947
Filed Aug. 18, 1976, Ser. No. 715,388
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 HP

251,025
FOOTBALL DART GAME TARGET
Robert W. Taylor, 3444 Wilton St., Long Beach, Calif. 90804
Filed Jan. 12, 1977, Ser. No. 758,710
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 FG

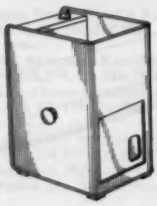


251,026
GOLF PUTTER HEAD
Nicholas A. Cruger, 700 Beverly Ave., Altamonte Springs, Fla. 32701
Filed Apr. 20, 1977, Ser. No. 789,127
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

251,027
GOLF PUTTER HEAD
Nicholas A. Cruger, 700 Beverly Ave., Altamonte Springs, Fla. 32701
Filed Apr. 20, 1977, Ser. No. 789,128
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

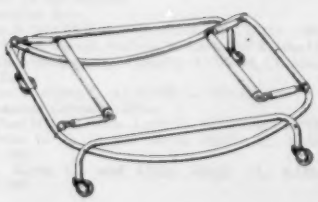
251,028
GOLF BAG SUPPORT
Paul A. O'Connor, P.O. Box 306, Hopatcong, N.J. 07843
Filed May 25, 1977, Ser. No. 800,171
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GB

251,029
BALL THROWING MACHINE
Jack S. Haller, Northbrook, and Robert L. Moore, LaGrange, both of Ill., assignors to Rallymaster, Inc., Elk Groove Village, Ill.
Filed Jul. 21, 1977, Ser. No. 817,546
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 R

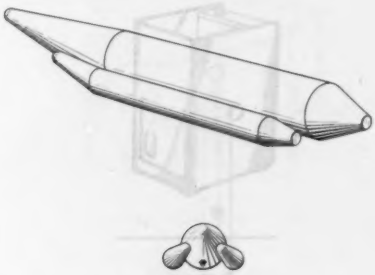


251,030
TOY HOUSE
William D. Gordon, Sr., Glenview, Ill., assignor to Arvey Corporation, Chicago, Ill.
Filed Dec. 27, 1976, Ser. No. 754,630
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL

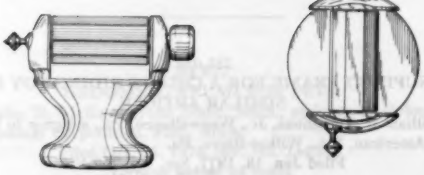
251,031
SUPPORT FRAME FOR A CHILD'S RIDING TOY OR SIMILAR ARTICLE
William R. Tomalinas, Jr., Wapwallopen, Pa., assignor to Roth American, Inc., Wilkes-Barre, Pa.
Filed Jan. 18, 1977, Ser. No. 760,404
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AE



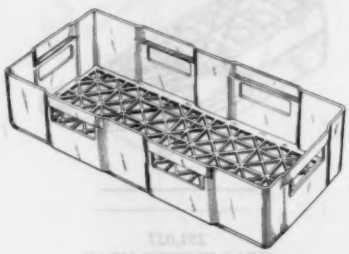
251,032
WATER SLED DEVICE
Burks A. Smith, Jr., Kansas City, Mo., and Wayne G. Smith, Overland Park, Kans., assignors to Bonair Boats, Inc., Lenexa, Kans.
Filed Mar. 14, 1977, Ser. No. 777,064
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D34—42



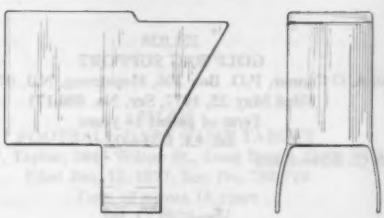
251,033
RUBBER STAMP
Linda R. Gulinson, 5663 Southmoor Cir., and James M. Littlehorn, 3940 S. Jason, both of Englewood, Colo. 80110
Filed Jul. 22, 1976, Ser. No. 707,885
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D18—15



251,034
BAKERY TRAY OR THE LIKE
James C. Carroll, and Lewis T. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 492,829, Jul. 29, 1974, Pat. No. Des. 242,496. This application May 24, 1976, Ser. No. 689,606
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R



251,035
COMBINED FLOOR-MOUNTED ARM REST AND STORAGE COMPARTMENT FOR A VEHICLE
Jerold Hart, 3300 Pembroke Rd., Hollywood, Fla. 33020
Filed Aug. 25, 1976, Ser. No. 717,561
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D87—1 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF FEBRUARY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A B C Auto Alarms, Inc.: *See*—
Faust, James H., 4,138,673, Cl. 340-405.000.

A. L. Lee Corporation: *See*—
Lee, Arthur L.; and Coval, Arthur B., 4,138,001, Cl. 188-170.000.

A. P. Green Refractories Co.: *See*—
Pasley, Edward L., 4,137,681, Cl. 52-127.000.

A/S Cheminova: *See*—
Klemmensen, Per D.; Kolind-Andersen, Hans; and Madsen, Hans B., 4,138,584, Cl. 560-124.000.

Aakronite Decoratives Limited: *See*—
Darroch, Lloyd R., 4,138,524, Cl. 428-217.000.

AB Kabi: *See*—
Andersson, Lars-Olov; Einarsson, Gudrun M.; and Kaplan, Lennart P., 4,138,287, Cl. 195-1.500.

Abbott Laboratories: *See*—
Von Esch, Anne M., 4,138,432, Cl. 260-502.500.

Abels, Theodor, to Linde AG. Steering assembly for a floor-type industrial vehicle with improved mounting means. 4,137,990, Cl. 180-155.000.

Abiko, Yasushi: *See*—
Ishikawa, Fumiyoshi; Kosasayama, Akira; Watanabe, Yoshifumi; Abiko, Yasushi; Kameda, Kin-ya; and Ono, Shin-etu, 4,138,491, Cl. 424-263.000.

ACF Industries, Incorporated: *See*—
Reedy, Charles E., 4,137,937, Cl. 137-321.000.

Achenbach, Karlheinz; and Bruckel, Dieter, to Olympia Werke AG. Roll cleaning device. 4,137,597, Cl. 15-256.510.

Acholonu, Kenny U.: *See*—
Panzer, Hans P.; and Acholonu, Kenny U., 4,138,563, Cl. 544-335.000.

Acs, Steven N.: *See*—
Pickett, David A.; and Acs, Steven N., 4,138,157, Cl. 297-386.000.

Adachi, Keiichi; Shisido, Tadao; Hara, Hiroshi; and Hirano, Shigeo, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,138,259, Cl. 96-74.000.

Adachi, Keiichi: *See*—
Hinata, Masanao; Mihara, Yuji; Shishido, Tadao; and Adachi, Keiichi, 4,138,266, Cl. 96-123.000.

Adams, Charles D., to Du Pont de Nemours, E. I., and Company. Process for preparing N-alkoxycarbonyl-N-alkylcyanamide. 4,138,585, Cl. 560-159.000.

Adams, John O.: *See*—
Mitchell, William D.; Adams, John O.; and Simmons, John J., 4,137,752, Cl. 73-45.500.

Adams, Richard M. Adjustable support attachment for strainer handles. 4,138,341, Cl. 210-470.000.

Adrian, Renate; von Schenck, Raban; Cox, Bernd; and Wirtz, Peter, to Hoechst Aktiengesellschaft. Hardeners for use in water-glass cement compositions and process for making them. 4,138,261, Cl. 106-84.000.

Aeritalia S.p.A.: *See*—
Herman, Gerald T., 4,137,992, Cl. 181-213.000.

Aerpat A.G.: *See*—
Clarke, Ronald L. C.; and Savage, Donald S., 4,137,747, Cl. 72-391.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Thal, Claude; Besselievre, Richard; Husson, Henri P.; and Potier, Pierre, 4,138,489, Cl. 424-256.000.

Agency of Industrial Science & Technology: *See*—
Ueda, Shigeru; Makino, Kazuo; Nakata, Yoshinori; Hasegawa, Yoshihisa; Yokoyama, Shinichi; Yoshida, Ryoichi; Maekawa, Yousuke; and Yoshida, Yuji, 4,138,035, Cl. 222-1.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Boie, Immo; Renner, Gunter; and Kunitz, Friedrich-Wilhelm, 4,138,263, Cl. 96-100.00N.
Boie, Immo; Renner, Gunter; and Kunitz, Friedrich-Wilhelm, 4,138,557, Cl. 544-183.000.
Krafft, Werner; and Helling, Gunter, 4,138,260, Cl. 96-77.000.

AGFA-GEVAERT N.V.: *See*—
Gilliams, Yvan K.; De Volder, Noel J.; Pollet, Robert J.; Tavernier, Bernard H.; De Jaeger, Nikolaas C.; and Sels, Francis J., 4,138,351, Cl. 252-62.10L.
Suys, Andre R.; and Van Landeghem, Willy K., 4,138,361, Cl. 252-301.330.

Agroferm AG: *See*—
Lafferty, Robert M., 4,138,291, Cl. 195-47.000.

Aigo, Seiichiro. Apparatus for bump-plating semiconductor wafers. 4,137,867, Cl. 118-627.000.

Air Products and Chemicals, Inc.: *See*—
Uffner, Melville W.; Jefferson, Donald E.; Coe, Charles G.; and Beitchman, Burton D., 4,138,385, Cl. 260-40.00R.

Aisin Seiki Kabushiki Kaisha: *See*—
Wakabayashi, Takaoki, 4,138,007, Cl. 192-53.00E.

Ajinomoto Co., Inc.: *See*—
Ohira, Toshiaki; Hara, Eisuke; and Takagi, Yasuo, 4,138,271, Cl. 127-34.000.
Sakakibara, Shumpei; Nagai, Yutaka; Fujiwara, Kenji; and Sakai, Takahiro, 4,138,394, Cl. 260-112.50R.

Akamatsu, Katsutaro: *See*—
Murakami, Shinichi; Akamatsu, Katsutaro; Yoshimitsu, Arata; and Noji, Sueyoshi, 4,138,279, Cl. 148-12.00E.

AKG Akustische u. Kino-Gerate Gesellschaft m.b.H.: *See*—
Cech, Karl, 4,138,598, Cl. 179-156.00A.

Akhmedov, Karim S.: *See*—
Khodzhakhanov, Nabi A.; Makhmudov, Takhir M.; and Akhmedov, Karim S., 4,138,425, Cl. 260-458.00C.

Akiyama, Taichiro; and Muto, Haruomi, to Koken Co., Ltd. Catheter apparatus with occlusion and flow diverting means. 4,137,906, Cl. 128-2.00A.

Aktiebolaget Atomenergi: *See*—
Andersson, Gustav S., 4,138,030, Cl. 220-3.000.

Aktiebolaget Draco: *See*—
Wetterlin, Kjell I. L., 4,137,914, Cl. 128-203.000.

Aktiebolaget IRO: *See*—
Jacobsson, Kurt A. G., 4,137,731, Cl. 66-132.00R.

Aktiebolaget Svenska Flaktfabriken: *See*—
Karlsson, Ingemar, 4,137,644, Cl. 34-23.000.

Aktieselskabet Nordiske Kabel- og Traadfabriker: *See*—
Procida, Francesco P.; Pedersen, Svend S.; and Carstensen, Peter, 4,138,462, Cl. 264-347.000.

Aladdin Industries, Incorporated: *See*—
Frye, Alva L.; and Stewart, Herbert M., 4,138,027, Cl. 215-13.00R.

Albert, Karmen D. Hermetically self sealing gasket for high vacuum fasteners. 4,138,080, Cl. 248-206.00R.

Albishausen, Hartmut. Cleaning apparatus. 4,137,600, Cl. 15-322.000.

Alexander, Robert W., to Armalite, Inc. Apparatus for producing ice. 4,137,724, Cl. 62-138.000.

Alfonso, Berta C. Collapsible trash carrier. 4,138,139, Cl. 280-652.000.

Alger, Richard N., to Champion International Corporation. Hydraulic weighing system. 4,137,977, Cl. 177-146.000.

Ali, M. Zaheer, to Communications Satellite Corporation. High speed FFT processor. 4,138,730, Cl. 364-726.000.

Alkor-Werk Karl Lissmann GmbH & Co KG: *See*—
Utz, Kastulus; Esterhammer, Josef; and Hakl, Heinz, 4,137,688, Cl. 53-432.000.

Allan, Kenneth N., to Allis-Chalmers Corporation. Sound abatement device for internal combustion engine. 4,137,888, Cl. 123-198.00E.

Allard, Rene: *See*—
Couture, Fernand; and Allard, Rene, 4,137,839, Cl. 99-541.000.

Allegheny Ludlum Industries, Inc.: *See*—
Lukac, Frederick S.; and Zbryski, William P., 4,138,273, Cl. 134-10.000.

Allen-Bradley Company: *See*—
Bremenour, Edwin L.; McAdams, Timothy E.; and Rhodes, Clifford A., 4,138,711, Cl. 361-424.000.
Toke, Ronald J.; and Donze, William A., 4,138,718, Cl. 364-200.000.

Allen, Louis N.: *See*—
Landolt, Paul H.; and Allen, Louis N., 4,138,539, Cl. 526-93.000.

Allied Chemical Corporation: *See*—
Pickett, David A.; and Acs, Steven N., 4,138,157, Cl. 297-386.000.

Alliegro, Richard A., to Norton Company. Armor structure and method of producing ceramic armor. 4,138,456, Cl. 264-65.000.

Allis-Chalmers Corporation: *See*—
Allan, Kenneth N., 4,137,888, Cl. 123-198.00E.
Kreitzberg, Ernest A.; and Zajichek, William J., 4,137,791, Cl. 74-473.00R.

Allocca, Michael A.; and Cinque, Gregory M., to Pitney-Bowes, Inc. System for remotely resetting postage rate memories. 4,138,735, Cl. 364-900.000.

Aluminum Company of America: *See*—
Rolles, Rolf; Williams, James E., Jr.; and Kondis, Thomas J., 4,138,511, Cl. 427-201.000.

ALZA Corporation: *See*—
Choi, Nam S.; and Heller, Jorge, 4,138,344, Cl. 252-1.000.

Amano, Kenichi; and Furuya, Noboru, to Kabushiki Kaisha Meidensha. Apparatus for examining liquid quality. 4,138,638, Cl. 324-29.000.

Ambico Inc.: *See*—
Montalbano, Anthony P., 4,138,689, Cl. 354-337.000.

American Cyanamid Company: *See*—
Landolt, Paul H.; and Allen, Louis N., 4,138,539, Cl. 526-93.000.
Martin, John H. E. J.; and Hertz, Martin R., 4,138,481, Cl. 424-181.000.
Murdock, Keith C.; and Child, Ralph G., 4,138,415, Cl. 260-378.000.

Panzer, Hans P.; and Acholonu, Kenny U., 4,138,563, Cl. 544-335.000.
Wang, Samuel S.; and Smith, Eugene L., Jr., 4,138,350, Cl. 252-61.000.

American Formed Plastics Corp.: *See*—
Morris, William D., 4,138,129, Cl. 280-152.00R.

American Hoechst Corporation: *See*—
Wenghoefer, Johann; and Messier, Dennis G., 4,138,395, Cl. 260-149.000.

American Home Products Corporation: *See*—
Freed, Meier E.; and Potoski, John R., 4,138,564, Cl. 544-346.000.
Freed, Meier E.; and Potoski, John R., 4,138,567, Cl. 544-388.000.
Givner, Morris L., 4,138,214, Cl. 23-230.00B.
Kao, Wenling, 4,138,590, Cl. 562-503.000.

American Optical Corporation: *See*—
Jansen, William D.; Haney, Jerry D.; Day, Christopher C.; and Schneeberger, Stephen A., 4,137,907, Cl. 128-2.05M.

American Standard Inc.: *See*—
Carmel, Edwin L., 4,137,643, Cl. 33-180.00R.

AMP Incorporated: *See*—
Davis, Newton G.; Hammond, James W.; and Loomis, Phillip E., 4,137,624, Cl. 29-566.100.
Knopp, Chauncey D., 4,138,184, Cl. 339-97.00P.
Shannon, Suel G., 4,138,188, Cl. 339-177.00E.

Andersen, George L., to General Signal Corporation. Force absorbing device and force transmission device. 4,138,141, Cl. 280-689.000.

Andersen, Kurt H. Slot machines. 4,138,114, Cl. 273-143.00R.

Andersen, Richard H.; Corsmeier, Robert J.; Rauf, James P.; and Lenahan, Dean T., to General Electric Company. Cooling air cooler for a gas turbine engine. 4,137,705, Cl. 60-39.080.

Anderson, Scott K. Phase lock loop. 4,138,650, Cl. 331-1.00A.

Anderson, Walter A.: *See*—
Knapp, William H.; Phillips, Carmen S.; and Anderson, Walter A., 4,137,697, Cl. 56-341.000.

Andersson, Gustav S., to Aktiebolaget Atomenergi. Pressure vessel joint. 4,138,030, Cl. 220-3.000.

Andersson, Lars-Olov; Einarsson, Gudrun M.; and Kaplan, Lennart P., to AB Kabi. Purifying and isolating method for hepatitis virus to use in preparing vaccine. 4,138,287, Cl. 195-1.500.

Ando, Shigenori, to Seiko Seiki Kabushiki Kaisha. Lubricating and cooling system for spindle bearing assembly. 4,137,997, Cl. 184-6.220.

Andrus, John R., to Waukesha-Pearce Industries, Inc. Device for measuring the static pressure of a moving fluid. 4,137,781, Cl. 73-707.000.

Anglin, Russell E. Reading instrument. 4,137,863, Cl. 116-306.000.

Anisimov, Stanislav M.: *See*—
Kazurov, Alexandr A.; Pevzner, Leonid M.; Mikhalina, Alexandra E.; Kachkov, Nikolai P.; Lapshinov, Georgy S.; Sedov, Nikolai S.; Kainkov, Nikolai P.; and Anisimov, Stanislav M., 4,137,951, Cl. 139-68.000.

Annett, Charles E., II. Solar heat absorber. 4,137,903, Cl. 126-271.000.

Anphar, S.A.: *See*—
Noverola, Armando V.; Soto, Jose P.; and Spickett, R. G. W., 4,138,492, Cl. 424-267.000.

Aoyama, Hideki; and Kawamoto, Koichi, to Teijin Limited. Method and apparatus for treating a yarn end of a yarn package. 4,138,072, Cl. 242-35.50A.

Aoyama, Kazuho: *See*—
Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,138,377, Cl. 260-23.70A.

Aoyama, Syunich: *See*—
Otsubo, Kizuku; Nakamura, Ken; and Aoyama, Syunich, 4,137,874, Cl. 123-119.00A.

Apellaniz, Ramon, to Euracom S.A. Tap for dispensing carbonated beverages. 4,138,092, Cl. 251-325.000.

Apparate- und Werkzengbau AG: *See*—
Krummenacher, Josef, 4,138,100, Cl. 269-137.000.

Arai, Kozo; Fukui, Shiomi; Nagata, Masaki; and Kotani, Teizo, to Japan Synthetic Rubber Co., Ltd. Pressure sensitive conductor and method of manufacturing the same. 4,138,369, Cl. 252-512.000.

Arakawa, Masatoshi; Ohno, Ryotaro; Ishikawa, Katuhiro; Yamahara, Noboru; and Matsui, Hisashi, to Japan Synthetic Rubber Co., Ltd. Cyclopentadiene derivative. 4,138,419, Cl. 260-429.00R.

Araki, Yoshihiko: *See*—
Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,138,377, Cl. 260-23.70A.

Archer, Dorothy J.: *See*—
Mineck, Fred, 4,137,878, Cl. 123-119.00B.

Arcilesi, Donald A., to M&T Chemicals Inc. Acid zinc electroplating process and composition. 4,138,294, Cl. 204-55.00R.

Arend, Gunter: *See*—
Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, 4,138,393, Cl. 526-287.000.

Argade, Shyam D.: *See*—
Balko, Edward N.; and Argade, Shyam D., 4,138,296, Cl. 204-128.000.

Arisato, Yasunori; and Koriyama, Hideaki, to Okuno Chemical Industry Company, Limited. Compositions for chemical copper plating. 4,138,267, Cl. 106-1.230.

Arkla Industries, Inc.: *See*—
Kuhlenschmidt, Donald, 4,137,727, Cl. 62-490.000.

Arlt, Dieter, to Bayer Aktiengesellschaft. Process for preparing phosphoric acid esterhalides. 4,138,452, Cl. 260-955.000.

Armalite, Inc.: *See*—
Alexander, Robert W., 4,137,724, Cl. 62-138.000.

Arms, Milo F.; and Ireland, James S., to Fairfield Engineering Company, The. Waste material digesters. 4,138,333, Cl. 195-127.000.

Armstrong Cork Company: *See*—
Bolgiano, Nicholas C., 4,138,299, Cl. 204-159.160.

Arnal, Claude; and Fidry, Francois. Rotary cleaning brushes. 4,137,594, Cl. 15-198.000.

Arndt, Henry C.: *See*—
Woessner, Warren D.; Biddlecom, William G.; Arndt, Henry C.; Peruzzotti, George P.; and Sih, Charles J., 4,138,582, Cl. 560-118.000.
Woessner, Warren D.; Biddlecom, William G.; Arndt, Henry C.; Peruzzotti, George P.; and Sih, Charles J., 4,138,583, Cl. 560-118.000.

Arnhold, Franz; and Husner, Walter, to Ernst Schweizer AG, Metallbau Zurich. Bending matrix and liner. 4,137,746, Cl. 72-389.000.

Arnoux, Daniel, to Societe Chauvin Arnoux. Constant-gain regulated-phase standard-phase converter. 4,138,717, Cl. 363-156.000.

Arp, Robert A.: *See*—
Miller, Curtis H.; and Arp, Robert A., 4,138,179, Cl. 339-17.0LC.

Arrem Plastics Inc.: *See*—
Muhlethaler, Richard V.; and Walls, Richard J., 4,138,716, Cl. 362-375.000.

Asahi Glass Company Ltd.: *See*—
Ukihashi, Hiroshi; Asawa, Tatsuro; Yamabe, Masaaki; and Miyake, Haruhisa, 4,138,373, Cl. 521-38.000.
Ukihashi, Hiroshi; Hayashi, Takao; and Takasaki, Yukio, 4,138,417, Cl. 260-406.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Ishijima, Shizuo; and Doi, Tsunesuke, 4,138,270, Cl. 106-291.000.

Asawa, Tatsuro: *See*—
Ukihashi, Hiroshi; Asawa, Tatsuro; Yamabe, Masaaki; and Miyake, Haruhisa, 4,138,373, Cl. 521-38.000.

Ashford, Donald A., to International Telephone and Telegraph Corporation. PCM time slot exchange. 4,138,597, Cl. 179-15.0AS.

Aspinwall, Robert H.; and Baker, Charles R., to General Motors Corporation. Jet propulsion. 4,137,708, Cl. 60-204.000.

Assistance Technique Medicale Serdal S.A. Societe anonyme: *See*—
Degonde, Jean; Freschard, Regis; and de Poulepiquet, Louis, 4,137,908, Cl. 128-2.06R.

Ataka, Arata: *See*—
Odazima, Mituo; Kikuchi, Rokuro; and Ataka, Arata, 4,137,884, Cl. 123-149.00D.

Atalla, Martin M., to Atalla Technovations. Card, system and method for securing user identification data. 4,138,057, Cl. 235-380.000.

Atalla, Martin M., to Atalla Technovations. Card, system and method for securing personal identification data. 4,138,058, Cl. 235-380.000.

Atalla Technovations: *See*—
Atalla, Martin M., 4,138,057, Cl. 235-380.000.
Atalla, Martin M., 4,138,058, Cl. 235-380.000.

Atara Corporation: *See*—
Murphy, Declan S., 4,138,335, Cl. 210-170.000.

Atlantic Richfield Company: *See*—
Loncaric, Rado G., 4,137,773, Cl. 73-421.00B.

Auer, Ekkehard: *See*—
Veitl, Giswalt; and Auer, Ekkehard, 4,137,616, Cl. 29-19.000.

Austin, George A., to Harmat Nominees Pty. Ltd. Torque wrench. 4,137,800, Cl. 81-57.390.

Avedik, Felix; and Renard, Vincent, to Etablissement Public dit "Centre National pour l'Exploitation des Oceans". Recording ocean bottom device, such as a seismograph. 4,138,658, Cl. 340-7.00R.

Avedissian, Michael K., to Western Electric Company, Inc. Controlling the pressure of a gas generator. 4,138,210, Cl. 431-12.000.

B. F. Goodrich Company, The: *See*—
Minchak, Robert J., 4,138,448, Cl. 260-879.000.

Baba, Osamu: *See*—
Narikiyo, Yasumasa; and Baba, Osamu, 4,138,633, Cl. 318-603.000.

Babcock, Alan W. Model aircraft control system. 4,138,103, Cl. 272-31.00A.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; Watanabe, Yoshihisa; Imanari, Makoto; and Nakajima, Fumito, 4,138,469, Cl. 423-239.000.

Bacha, John D.; and Selwitz, Charles M., to Gulf Research & Development Company. Simultaneous production and purification of 4-nitro-omicron-phthalic anhydride. 4,138,412, Cl. 260-346.300.

Bacskai, Robert, to Chevron Research Company. Catalyst preparation for the polymerization of pyrrolidone. 4,138,546, Cl. 528-312.000.

Baecke, Antoine M. R.: *See*—
Oosterling, Pieter A.; and Baecke, Antoine M. R., 4,137,783, Cl. 74-47.000.

Bahr, Theodor: *See*—
Velinsky, Johannes; and Bahr, Theodor, 4,138,338, Cl. 210-327.000.

Bahr, Werner, to Richard Schoeps KG & Co. GmbH, Firma. Apparatus for automatically melting and casting fusible material. 4,138,209, Cl. 425-160.000.

Baker, Charles R.: *See*—
Aspinwall, Robert H.; and Baker, Charles R., 4,137,708, Cl. 60-204.000.

Baker, David E. Bowling alley gutter duster apparatus. 4,137,591, Cl. 15-98.000.

Baker, Robert A., to Engineered Products, Inc. Camera case. 4,138,045, Cl. 224-5.00V.

Balasfalvy, Ferenc, to Ciba-Geigy Corporation. Manufacture of maleimides via cyclizing dehydration. 4,138,406, Cl. 260-326.260.

Balde Werke GmbH & Co. KG: *See*—
Lange, Karl-Heinz, 4,137,782, Cl. 74-32.000.

Baldwin, Beecher B.; and Higgins, Harold, to Baldwin/Green Inc. Gymnastic mat. 4,137,583, Cl. 5-344.000.

Baldwin/Green Inc.: *See—*
Baldwin, Beecher B.; and Higgins, Harold, 4,137,583, Cl. 5-344.000.

Baldwin, Terence R.; Bennett, David J.; and Lees, William A. Anaerobic curing compositions. 4,138,449, Cl. 260-879.000.

Balko, Edward N.; and Argade, Shyam D., to BASF Wyandotte Corporation. Method for removing nitrogen trichloride from chlorine gas. 4,138,296, Cl. 204-128.000.

Ball Corporation: *See—*
Dembowski, Ronald J.; and Werbil, David O., 4,138,537, Cl. 526-47.800.
Mahoney, William P., 4,138,029, Cl. 215-230.000.

Ballast-Nedam Groep N.V.: *See—*
Middelbeek, Cornelis G.; Wolters, Tjako A.; and Den Boer, Jan B., 4,138,342, Cl. 210-522.000.

Balog, Ronald J.: *See—*
McAdams, Hugh P., Jr.; and Balog, Ronald J., 4,138,661, Cl. 340-27.0AT.

Banki, Steven: *See—*
Siegert, Daniel H.; and Banki, Steven, 4,137,999, Cl. 184-45.00R.

Barabas, Eugene S.; and Klein, Andrew, to GAF Corporation. Preparation of copolymer emulsions of an α,β-unsaturated carboxylic acid and methyl acrylate. 4,138,380, Cl. 260-29.60Z.

Barber-Colman Company: *See—*
Schewe, Richard A., 4,138,071, Cl. 242-18.0DD.

Bargain, Michel; and Millet, Claude, to Rhone-Poulenc Industries. Polymerization of organopolysiloxanes. 4,138,543, Cl. 528-14.000.

Barkwith, John R., to RCA Corporation. Idle-busy signalling between telephone system and radiophone system. 4,138,595, Cl. 179-2.00E.

Barna, Joseph A.: *See—*
Brugger, Richard D.; and Barna, Joseph A., 4,138,608, Cl. 235-92.0FL.

Barner, Richard; Boguth, Walter; Leuenberger, Hans G. W.; Schmid, Max; and Zell, Reinhard, to Hoffmann-La Roche Inc. Process for the manufacture of tertiary, optically active aliphatic compounds. 4,138,289, Cl. 195-30.000.

Barnes, David; and Metters, Champa H., to University of Strathclyde. Polarographic apparatus. 4,138,322, Cl. 204-195.00H.

Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, to Rhone-Poulenc Industries. 1,2-Dithiole derivatives. 4,138,487, Cl. 424-250.000.

BASF Aktiengesellschaft: *See—*
Baur, Karl G.; Hellbach, Hans; Platz, Rolf; and Taglieber, Kurt, 4,138,591, Cl. 568-756.000.
Hillenbrand, Engelbert; Fromm, Hermann D.; and Widmann, Alfred, 4,138,560, Cl. 544-203.000.
Neubauer, Gerald; Van Wauwe, Gerard; Beullens, Josef; Brand, Uwe; Fuchs, Hugo; and Kartte, Klaus, 4,138,472, Cl. 423-549.000.
Sander, Bruno; Mueller, Albrecht; Merkle, Hans; and Janisch, Gerhard, 4,138,269, Cl. 106-90.000.
Sander, Bruno; Bonitz, Eckhard; Voss, Heinz; and Gaerber, Wolfgang, 4,138,315, Cl. 162-146.000.
Siegel, Hardo; and Naarmann, Herbert, 4,138,542, Cl. 526-305.000.

BASF Wyandotte Corporation: *See—*
Balko, Edward N.; and Argade, Shyam D., 4,138,296, Cl. 204-128.000.
Nassry, Assadullah; and Maxwell, Jerrold F., 4,138,346, Cl. 252-32.500.
Patil, Arvind S.; and Weissman, Eugene Y., 4,138,314, Cl. 162-102.000.

Bassist, Rudolph G. Needle support assembly for a knitting machine. 4,137,730, Cl. 66-114.000.

Batts, John R. Hydraulically-operated fertilizer and chemical-spreading boom. 4,138,063, Cl. 239-168.000.

Baumann, Marcus: *See—*
Bohner, Beat; and Baumann, Marcus, 4,138,243, Cl. 71-94.000.

Baumann, Werner, to Sandoz Ltd. 2-Phenoxy and 2-phenylthio anthraquinone disperse dyes. 4,138,414, Cl. 260-372.000.

Baumer, Walter. Deflectable parking space reservation indicator. 4,137,662, Cl. 40-612.000.

Bauml, Kurt; Gunsser, Otto C.; and Lohse, Rudolf K., to Gebruder Heller Machinenfabrik GmbH. Method of machining winding slots of generator rotors. 4,137,823, Cl. 90-64.000.

Baur, Karl G.; Hellbach, Hans; Platz, Rolf; and Taglieber, Kurt, to BASF Aktiengesellschaft. Manufacture of alkylphenols. 4,138,591, Cl. 568-756.000.

Bayer Aktiengesellschaft: *See—*
Arlt, Dieter, 4,138,452, Cl. 260-955.000.
Kuhnlein, Hans L.; and Muller, Wolfgang-Dieter, 4,138,309, Cl. 159-13.00A.
Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, 4,138,393, Cl. 526-287.000.
Meussdoerffer, Johann N.; Bockelmann, Wolfgang; and Niederprum, Hans, 4,138,466, Cl. 423-61.000.
Psaar, Hubertus, 4,138,570, Cl. 548-379.000.
Reinehr, Ulrich; and Schmidt, Wolfhard, 4,138,461, Cl. 264-206.000.
Truscheit, Ernst; Bierling, Robert; Schlumberger, Horst D.; and Oettgen, Herbert F., 4,138,479, Cl. 424-88.000.

Bayer, Karl-Heinz; Blaschke, Felix; Neuffer, Ingemar; and Michel, Wolfgang, to Siemens Aktiengesellschaft. Apparatus for determining defining quantities of a planar vector. 4,138,729, Cl. 364-603.000.

Bayer, Karol: *See—*
Mossiossian, Varoujan; and Bayer, Karol, 4,137,722, Cl. 405-202.000.

Beasley, John K.; Beckerbauer, Richard; Schleinitz, Henry M.; and Wilson, Frank C., to Du Pont de Nemours, E. I., and Company. Low attenuation optical fiber of deuterated polymer. 4,138,194, Cl. 350-96.300.

Beauchamp, Aaron C., to United States of America, Army. Riot control weapon. 4,137,893, Cl. 124-72.000.

Beck, Robert L.; and Goebel, Peter H., to Motorola, Inc. Programmable probe fixture and method of connecting units under test with test equipment. 4,138,643, Cl. 324-158.00F.

Becker, Friedbert; Grafinger, Wilhelm; and Hildebrandt, Bernhard, to Siemens Aktiengesellschaft. Method and device for increasing the security against transmission errors in an information transmission system. 4,138,676, Cl. 343-6.50R.

Becker, Harry C. Fail-safe measuring weight. 4,137,980, Cl. 177-264.000.

Beckerbauer, Richard: *See—*
Beasley, John K.; Beckerbauer, Richard; Schleinitz, Henry M.; and Wilson, Frank C., 4,138,194, Cl. 350-96.300.

Beckmann, Jurgen: *See—*
Kalka, Josef; and Beckmann, Jurgen, 4,138,310, Cl. 159-47.00R.

Beecham Group Limited: *See—*
Cassidy, Frederick; and Wootton, Gordon, 4,138,407, Cl. 260-326.330.
Howarth, Thomas T.; Brown, Allan G.; Corbett, David F.; and Ponsford, Roger J., 4,138,403, Cl. 260-307.0FA.

Behnke, Horst, to Carl Hurth Maschinen-und Zahnradfabrik. Mandrel for receiving the tool in a hobbing machine or a similar machine. 4,137,822, Cl. 90-11.00A.

Beiersdorf Aktiengesellschaft: *See—*
Malek, Wasfi N., 4,138,527, Cl. 428-425.000.

Beitchman, Burton D.: *See—*
Uffner, Melville W.; Jefferson, Donald E.; Coe, Charles G.; and Beitchman, Burton D., 4,138,385, Cl. 260-40.00R.

Bel Air Mart: *See—*
Hartup, Frederick W., 4,138,000, Cl. 186-1.00A.

Belart, Juan, to ITT Industries, Inc. Power brake unit. 4,137,718, Cl. 60-551.000.

Bell Telephone Laboratories, Incorporated: *See—*
Cho, Alfred Y., 4,137,865, Cl. 118-49.100.

Belov, Mikhail F.: *See—*
Muratov, Rustem I.; Kot, Jury D.; Belov, Mikhail F.; Gildengorn, Melis S.; Konkov, Vyacheslav S.; and Erlikh, Mikhail I., 4,137,745, Cl. 72-263.000.

Beltran, Adrian M.; Muth, Myron C.; and Schilling, William F., to General Electric Company. Method of fabricating composite structures for water cooled gas turbine components. 4,137,619, Cl. 29-156.80H.

Bendiberica S.A.: *See—*
Bruguera, Raimundo S., 4,138,204, Cl. 417-300.000.

Bendix Corporation, The: *See—*
Kirner, Ernest O., 4,138,678, Cl. 343-17.700.

Benedict, Charles E., to Tesseract Corporation. Article handling belt. 4,137,821, Cl. 89-35.00R.

Bennett, David J.: *See—*
Baldwin, Terence R.; Bennett, David J.; and Lees, William A., 4,138,449, Cl. 260-879.000.

Benson, Carl L., Jr., to Paragon Gears Incorporated. Power transmission of the interleaved, multiple friction plate clutch type. 4,138,006, Cl. 192-48.910.

Beres, William J. Fishing sinker. 4,137,664, Cl. 43-43.100.

Berg, Gerhard, deceased (by Berg, Ingrid, legal representative); and Nordsiek, Karl-Heinz, to Chemische Werke Huels Aktiengesellschaft. Process for the production of pulverulent, pourable elastomer-filler mixtures optionally containing plasticizer oil. 4,138,375, Cl. 260-17.00R.

Berg, Ingrid, legal representative: *See—*
Berg, Gerhard, deceased; and Nordsiek, Karl-Heinz, 4,138,375, Cl. 260-17.00R.

Berges, David A., to SmithKline Corporation. 7-Amino-3-(sulfoalkyl substituted oxadiazolylthiomethyl) cephalosporins. 4,138,556, Cl. 544-26.000.

Berkshire, David C.: *See—*
McLaughlin, William A.; and Berkshire, David C., 4,137,972, Cl. 166-307.000.

Bernier et Cie: *See—*
Bernier, Raymond, 4,138,180, Cl. 339-95.00R.

Bernier, Raymond, to Bernier et Cie. Plug. 4,138,180, Cl. 339-95.00R.

Berthold, Cornelius E.: *See—*
Gill, Ronald A.; Wojtowicz, Waldemar S.; Berthold, Cornelius E.; and Wheeler, Cecil M., 4,138,312, Cl. 162-30.00R.

Bertin & Cie: *See—*
Croix-Marie, Francis J., 4,137,988, Cl. 180-130.000.

Berzen, Josef: *See—*
Lutze, Siegfried; Schneller, Peter; Birnkraut, Hans-Walter; Berzen, Josef; and Hetkamp, Gunter, 4,138,540, Cl. 526-159.000.

Besack, Harold C. Solar heating system. 4,138,061, Cl. 237-1.00A.

Besselievre, Richard: *See—*
Thal, Claude; Besselievre, Richard; Husson, Henri P.; and Potier, Pierre, 4,138,489, Cl. 424-256.000.

Beullens, Josef: *See—*
Neubauer, Gerald; Van Wauwe, Gerard; Beullens, Josef; Brand, Uwe; Fuchs, Hugo; and Kartte, Klaus, 4,138,472, Cl. 423-549.000.

Beusing, Julius. Apparatus for connecting a cover band to guide blading of a turbomachine. 4,137,620, Cl. 29-243.530.

Beuther, Harold; McKinney, Joel D.; and Swift, Harold E., to Gulf Research & Development Company. Process for conversion of gas oil to ethylene and needle coke. 4,138,325, Cl. 208-50.000.

Beyl, Jean J. A. Ski brake. 4,138,137, Cl. 280-605.000.

Bicskei, Bela J. Precision blocking of lens blanks. 4,138,085, Cl. 249-83.000.

Biddlecom, William G.: *See*—
Woessner, Warren D.; Biddlecom, William G.; Arndt, Henry C.; Peruzzotti, George P.; and Sih, Charles J., 4,138,582, Cl. 560-118.000.
Woessner, Warren D.; Biddlecom, William G.; Arndt, Henry C.; Peruzzotti, George P.; and Sih, Charles J., 4,138,583, Cl. 560-118.000.

Bierling, Robert: *See*—
Truscheit, Ernst; Bierling, Robert; Schlumberger, Horst D.; and Oettgen, Herbert F., 4,138,479, Cl. 424-88.000.

Bierwiler, Martha. Children's marionette theatre. 4,137,665, Cl. 46-13.000.

Bills, Marius W. Window lock. 4,138,150, Cl. 292-60.000.

Binford, Benjamin L.: *See*—
Young, Dan B.; and Binford, Benjamin L., 4,137,771, Cl. 73-363.900.

Bio-Medical Sciences, Inc.: *See*—
Larsson, Raymond P.; and Witonsky, Robert J., 4,138,216, Cl. 422-56.000.

Birnkraut, Hans-Walter: *See*—
Lutze, Siegfried; Schneller, Peter; Birnkraut, Hans-Walter; Berzen, Josef; and Hetkamp, Gunter, 4,138,540, Cl. 526-159.000.

Bischoff, William F.: *See*—
Steiner, Peter; and Bischoff, William F., 4,138,020, Cl. 214-17.00C.

Bittinger, Raymond W. Draft device for fireplace. 4,137,895, Cl. 126-120.000.

Black Clawson Company, The: *See*—
Kessler, Norbert; and Robbins, John M., 4,138,316, Cl. 162-200.000.

Black and Decker Manufacturing Company, The: *See*—
Pfanzer, Gerhard, 4,137,632, Cl. 30-393.000.

Blaschke, Felix: *See*—
Bayer, Karl-Heinz; Blaschke, Felix; Neuffer, Ingemar; and Michel, Wolfgang, 4,138,729, Cl. 364-603.000.

Blazevic, Milos. Device for automatically recording, reproducing and translating, a magnetic transducer. 4,138,696, Cl. 360-2.000.

Bliss, Robert A.: *See*—
Dutcher, Daniel P.; and Bliss, Robert A., 4,138,012, Cl. 206-45.190.

Block Engineering, Inc.: *See*—
Mantz, Arlan W., 4,138,727, Cl. 364-525.000.

Blomberg, Folke I.; Holst, Jan-Olov M.; and Nordstrom, Torbjorn. Brake anti-locking modulator with reapplication control. 4,138,165, Cl. 303-115.000.

Blount, David H. Process for the polymerization of allyl halides to produce poly(allylsilicoformate) polymers. 4,138,421, Cl. 260-448.20E.

Blue Wing Corporation: *See*—
Hart, James R.; and Brown, Patrick D., 4,138,505, Cl. 426-573.000.

Bluestein, Ben A., to General Electric Company. Poly(olefinic monomer) filled-poly(organosiloxane) compositions. 4,138,387, Cl. 260-42.260.

Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, to Forschungs Institut fur Textiltechnologie. Treatment of high-polymer materials. 4,138,298, Cl. 204-159.120.

Boc Limited: *See*—
Garrett, Michael E., 4,138,330, Cl. 210-63.00R.

Bockelmann, Wolfgang: *See*—
Meussdoerffer, Johann N.; Bockelmann, Wolfgang; and Niederprum, Hans, 4,138,466, Cl. 423-61.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Huber, Bernhard W., 4,138,215, Cl. 422-58.000.

Bodoh, Albinus G.: *See*—
Cox, Robert N.; and Bodoh, Albinus G., 4,138,174, Cl. 312-333.000.

Boeing Commercial Airplane Company: *See*—
Nazarenus, Carl L., 4,138,200, Cl. 408-241.00S.

Boeing Company, The: *See*—
Herman, Gerald T., 4,137,992, Cl. 181-213.000.

Bogdanoff, Anatoly: *See*—
Porter, Gary D.; and Bogdanoff, Anatoly, 4,138,317, Cl. 176-1.000.

Bogert, Clayton. Medical by-pass device for use after ostomy surgery. 4,137,918, Cl. 128-283.000.

Boguth, Walter: *See*—
Barner, Richard; Boguth, Walter; Leuenberger, Hans G. W.; Schmid, Max; and Zell, Reinhard, 4,138,289, Cl. 195-30.000.

Bohm, Bernhard: *See*—
Schabert, Hans-Peter; and Bohm, Bernhard, 4,138,319, Cl. 176-65.000.

Bohme, Ekkehard H., to Richardson-Merrell Inc. 6-(2,3-Dihydro-5-benzofuranyl)acetamido penicillin derivatives. 4,138,397, Cl. 260-239.100.

Bohner, Beat; and Baumann, Marcus, to Ciba-Geigy Corporation. Novel heterocyclic compounds. 4,138,243, Cl. 71-94.000.

Boie, Immo; Renner, Gunter; and Kunitz, Friedrich-Wilhelm, to Agfa-Gevaert Aktiengesellschaft. Photographic silver halide material with 2-equivalent, N-heterocyclic yellow couplers. 4,138,263, Cl. 96-100.00N.

Boie, Immo; Renner, Gunter; and Kunitz, Friedrich-Wilhelm, to Agfa-Gevaert Aktiengesellschaft. 2-Equivalent yellow couplers. 4,138,557, Cl. 544-183.000.

Bolgiano, Nicholas C., to Armstrong Cork Company. Process utilizing a photopolymerizable and moisture curable coating containing partially capped isocyanate prepolymers and acrylate monomers. 4,138,299, Cl. 204-159.160.

Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, to Lanier Business Products, Inc. Cassette central dictation system. 4,138,695, Cl. 360-92.000.

Boliden Aktiebolag: *See*—
Hedenas, Bo G. V.; Wiklund, Johan E.; Johansson, Thore R. H.; and Melkersson, Karl-Axel, 4,138,231, Cl. 55-71.000.

Bolme, Donald W. Method of preventing escape of nitrogen oxides from an aqueous nitrate solution. 4,138,470, Cl. 423-390.000.

Bologna, Alfred. Apparatus for removing debris during sewage treatment. 4,138,343, Cl. 210-526.000.

Bond, Curtis J., to Liqui-Box Corporation. Helical coil tube-form insert for flexible bags. 4,138,036, Cl. 222-105.000.

Bongianni, Wayne L., to Rockwell International Corporation. Multiple magnetic layer composite for magnetostatic surface wave propagation. 4,138,651, Cl. 333-30.00R.

Bonitz, Eckhard: *See*—
Sander, Bruno; Bonitz, Eckhard; Voss, Heinz; and Gaerber, Wolfgang, 4,138,315, Cl. 162-146.000.

Bonkohara, Manabu; and Kasuga, Hisao, to Nippon Electric Co., Ltd. Framed lead assembly for a semiconductor device comprising insulator reinforcing strips supported by a frame and made integral with lead strips. 4,138,691, Cl. 357-70.000.

Bonner, Darcy R. Wearable chair. 4,138,156, Cl. 297-4.000.

Bonnet, Ludwig, to Richarg Wolf GmbH. Endoscopes. 4,137,920, Cl. 128-311.000.

Bonnett, Robert N. Electronic aid for inhibiting smoking. 4,138,722, Cl. 364-415.000.

Bonzo, Roy T.; and Knowles, Daniel H., to Corning Glass Works. Winding apparatus for glass optical filaments. 4,138,069, Cl. 242-18.00A.

Bormioli, Giorgio. Pipe element with a terminal hydraulic seal comprising a differential mobile member. 4,138,149, Cl. 285-320.000.

Bornand, Jean-Daniel: *See*—
Buxmann, Kurt; Bornand, Jean-Daniel; and Steinegger, Alfred, 4,138,246, Cl. 75-68.00R.

Borovikova, Sofia M.: *See*—
Buls, Yanis I.; Gailis, Gunar E.; Borovikova, Sofia M.; Lurie, Evgeny V.; and Mikhailov, Valery F., 4,138,065, Cl. 241-55.000.

Borresen, Thor; and Harder, Niels U., to Thor Borresen. Process for producing good adherence between a metal and polysulphide material and articles produced thereby. 4,138,526, Cl. 428-419.000.

Bostrom, Harry H., to ECM Motor Company. Power opener with manual override. 4,137,796, Cl. 74-625.000.

Boucher, Raymond R.; and Metcalfe, Robert A., to United Technologies Corporation. Combined crucible, tundish and pouring spout. 4,138,096, Cl. 266-240.000.

Bouman, Cornelis, to W. van Oordt & Co. Holding B.V. Rupturable package. 4,138,014, Cl. 206-542.000.

Boutell, Richard G.; and Grigsby, Carroll M., to Scovill Manufacturing Company. Remote shifter for vehicle transmissions. 4,137,824, Cl. 91-1.000.

Bowe Bohler & Weber KG: *See*—
Fuhring, Heinrich, 4,137,646, Cl. 34-75.000.

Boyce, Clive B. C.; and Webb, Shirley B., to Shell Oil Company. 3-Pyrid-3-ylisoxazolidine. 4,138,402, Cl. 546-275.000.

Boyd, Douglas P., to Lelane Standard Junior University, Board of Trustees of The. Limited scan angle fan beam computerized tomography. 4,138,721, Cl. 364-414.000.

Boyd, Jerry L., to McCluskey, Stanley A. Box metering system. 4,137,830, Cl. 93-55.000.

Boyd, Jerry L.: *See*—
McClusky, Stanley A.; and Boyd, Jerry L., 4,137,689, Cl. 53-502.000.

Bradley, Robert F., to Micro Circuits Company. Weight training apparatus. 4,138,106, Cl. 272-129.000.

Bradshaw, Janice: *See*—
Cook, Martin C.; Gregory, Gordon I.; and Bradshaw, Janice, 4,138,555, Cl. 544-22.000.

Brand, Uwe: *See*—
Neubauer, Gerald; Van Wauwe, Gerard; Beullens, Josef; Brand, Uwe; Fuchs, Hugo; and Kartte, Klaus, 4,138,472, Cl. 423-549.000.

Brandenstein, Manfred: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,138,167, Cl. 308-6.00C.

Brannon, Jeanetta H. Card-type game and apparatus for playing same. 4,138,119, Cl. 273-236.000.

Braun AG: *See*—
Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, 4,138,593, Cl. 179-1.00E.

Brauns, Frank; and Sullivan, John L., Jr., to Novatronics, Inc. Apparatus for forming a permanent end loop in a fabric web. 4,137,856, Cl. 112-104.000.

Brautigam, Robert F. Solar heating system. 4,137,900, Cl. 126-271.000.

Brazinsky, Irving; Cooper, William M.; and Gould, Arnold S., to Celanese Corporation. Process for preparing a microporous polymer film. 4,138,459, Cl. 264-154.000.

Breed, Dirk J.; Voermans, Antonius B.; and Logmans, Hans, to U.S. Philips Corporation. Magnetic structures. 4,138,530, Cl. 428-539.000.

Bremenour, Edwin L.; McAdams, Timothy E.; and Rhodes, Clifford

A., to Allen-Bradley Company. Static control device for printed circuit package. 4,138,711, Cl. 361-424.000.

Brems, John H. Prime mover mechanism. 4,137,797, Cl. 74-801.000.

Bridgeford, Douglas J., to Teepak, Inc. Internally coated sausage casing with improved meat release composition. 4,137,947, Cl. 138-118.100.

Bridgestone Tire Company Limited: *See*—
Suzuki, Masao; and Yamajo, Tsutomu, 4,138,340, Cl. 210-396.000.

Bright, James A.; and Deaton, Homer W., to General Motors Corporation. Clothes washer tub having improved washability means. 4,137,735, Cl. 68-18.00D.

Brill, Karl H.; Schenk, Gerhard; and Weinlich, Rudolf, to Enzinger-Union-Werke AG. Liquids containers. 4,137,954, Cl. 141-90.000.

Briscall, Harry, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Filament-reinforced hollow body with internal flange and method of forming same. 4,137,950, Cl. 138-172.000.

Bristol-Myers Company: *See*—
Crenshaw, Ronnie R.; Luke, George M.; and Partyka, Richard A., 4,138,561, Cl. 544-284.000.
Naito, Takayuki; Okumura, Jun; and Oka, Masahisa, 4,138,554, Cl. 544-22.000.

British Petroleum Company Limited, The: *See*—
Pennock, Michael D., 4,137,975, Cl. 175-65.000.

Brittain, David R.; Brown, Edward D.; Hepworth, Walter; and Stacey, Gilbert J., to Imperial Chemical Industries Limited. Analgesic compositions containing 1,2-dihydro-2-oxoquinol-4-ylpropionic acid derivatives. 4,138,490, Cl. 424-258.000.

Broadway, Alexander R. W.; Fong, William; and Rawcliffe, Gordon H., to National Research Development Corporation. Alternating current electric motors and generators. 4,138,619, Cl. 310-184.000.

Brokmeier, Dieter: *See*—
Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, 4,138,393, Cl. 526-287.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Yoneji, Satoshige; Higuchi, Yoshiharu; and Mori, Shushin, 4,137,860, Cl. 112-277.000.

Brown, Allan G.: *See*—
Howarth, Thomas T.; Brown, Allan G.; Corbett, David F.; and Ponsford, Roger J., 4,138,403, Cl. 260-307.0FA.

Brown, Arthur K., Jr. Mop with a wringer roller. 4,137,592, Cl. 15-119.00A.

Brown, Edgar D., Jr., to General Electric Company. Silicone lubricant compositions containing trischloroethyl-phosphite and/or bis-chloroethyl chloroethyl phosphonate. 4,138,349, Cl. 252-49.900.

Brown, Edward D.: *See*—
Brittain, David R.; Brown, Edward D.; Hepworth, Walter; and Stacey, Gilbert J., 4,138,490, Cl. 424-258.000.

Brown, Jeffrey L. Sanitary self-contained fecal waste container. 4,138,153, Cl. 294-1.00R.

Brown, Leslie A.; and Norton, Harry W., to F. W. McConnel Limited. Vehicle weight transfer mechanism. 4,138,133, Cl. 280-405.00B.

Brown, Patrick D.: *See*—
Hart, James R.; and Brown, Patrick D., 4,138,505, Cl. 426-573.000.

Brown, Richard N., to General Electric Company. Cooking appliance. 4,138,606, Cl. 219-442.000.

Brown, Robert, to Nairn Floors Limited. Flooring materials. 4,138,521, Cl. 428-159.000.

Brown, Robert N. Portable scaffolding device. 4,137,996, Cl. 182-150.000.

Brown, Robert S., to Milliken Research Corporation. Device for scrubbing carpet. 4,137,590, Cl. 15-50.00R.

Brown, Trevor J., to General Motors Corporation. Tapered shank ball stud assembly with collapsible washer. 4,138,198, Cl. 403-247.000.

Browning Arms Company: *See*—
Farber, Leland A., 4,137,663, Cl. 42-51.000.

Bruckel, Dieter: *See*—
Achenbach, Karlheinz; and Bruckel, Dieter, 4,137,597, Cl. 15-256.510.

Brugger, Richard D.; and Barna, Joseph A., to Zurn Industries, Inc. Remote readout meter reading system. 4,138,608, Cl. 235-92.0FL.

Bruguera, Raimundo S., to Bendiberica S.A. Gear pump. 4,138,204, Cl. 417-300.000.

Brummenaes, Irving. Process for mooring a ship and a fender arrangement for such mooring process. 4,137,861, Cl. 114-219.000.

Brunelle, Jean-Pierre, to Societe Francaise des Produits pour Catalyse "Procatalyse". Hydrodealkylation of alkylaromatic hydrocarbons. 4,138,443, Cl. 260-672.00R.

Brygger, Flemming, to Harvey Hubbell, Incorporated. Lift cover assembly for electrical wiring device. 4,138,187, Cl. 339-117.00R.

Bryngdahl, Olof, to Xerox Corporation. Geometrical transformations in optics. 4,138,190, Cl. 350-3.700.

Buchler, Wolfram: *See*—
Schneider, Franz; Waller, Eugen; Buchler, Wolfram; and Weber, Heinz, 4,138,005, Cl. 192-12.00C.

Buckley, Bruce S., to Massachusetts Institute of Technology. Controllable heat transmission apparatus. 4,137,964, Cl. 165-1.000.

Buckley, Janette A.: *See*—
French, John B.; Reid, Neil M.; and Buckley, Janette A., 4,137,750, Cl. 73-23.000.

Budney, David R. A. Golf club grip training device. 4,138,118, Cl. 273-183.00D.

Budzich, Tadeusz. Load responsive system pump controls. 4,137,716, Cl. 60-445.000.

Bullock, Norman J., to W. M. Cissell Manufacturing Company. Laundry dryer. 4,137,645, Cl. 34-35.000.

Buls, Yanis I.; Gailis, Gunar E.; Borovikova, Sofia M.; Lurie, Evgeny V.; and Mikhailov, Valery F. Device for preparing fibre-filled polymeric compositions. 4,138,065, Cl. 241-55.000.

Bunch, Jesse C. Energy concentrator system. 4,137,902, Cl. 126-271.000.

Bundy, Gordon L.; and Nelson, Norman A., to Upjohn Company, The. 11-Deoxy-2,2-difluoro-ω-aryl-PGE compounds. 4,138,573, Cl. 560-55.000.

Bundy, Gordon L.; and Nelson, Norman A., to Upjohn Company, The. 11-Deoxy-16-phenoxy-PGF compounds. 4,138,575, Cl. 560-55.000.

Bundy, Gordon L.; and Nelson, Norman A., to Upjohn Company, The. 11-Deoxy-2,2-difluoro-ω-aryl-PGF compounds. 4,138,576, Cl. 560-55.000.

Bundy, Gordon L.; and Nelson, Norman A., to Upjohn Company, The. 11-Deoxy-cis-4,5-didehydro-ω-aryl-PGF compounds. 4,138,577, Cl. 560-55.000.

Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-16-phenyl-17,18,19,20-tetranor-5,6,13,14-tetradehydro-4,4,5,5,13,14-hexadehydro-pgf$_1$ compounds. 4,138,578, Cl. 560-55.000.

Bunger, David A., to D. H. Baldwin Company. Arpeggio system for electronic organs. 4,137,809, Cl. 84-1.030.

Burlington Industries, Inc.: *See*—
Webster, Michael T., 4,137,615, Cl. 28-218.000.

Burroughs Corporation: *See*—
Chu, Ke-Chiang; and Sharp, Richard S., 4,138,720, Cl. 364-200.000.

Butler, Walter J.: *See*—
Eichelberger, Charles W.; and Butler, Walter J., 4,138,665, Cl. 340-347.0NT.
Eichelberger, Charles W.; and Butler, Walter J., 4,138,666, Cl. 340-347.0CC.

Buxmann, Kurt; Bornand, Jean-Daniel; and Steinegger, Alfred, to Swiss Aluminium Ltd. Process for lowering the concentration of sodium in aluminum melts. 4,138,246, Cl. 75-68.00R.

C. Conradty, Firma: *See*—
Koziol, Konrad; Rathjen, Hans-Carl; and Sieberer, Karl-Heinz, 4,138,510, Cl. 427-124.000.

Cabeen, Robert P., III: *See*—
Fallon, John J., Jr.; and Cabeen, Robert P., III, 4,137,965, Cl. 165-1.000.

Cabot Corporation: *See*—
Rosof, Barry H., 4,138,249, Cl. 75-103.000.

California Institute of Technology: *See*—
Rembaum, Alan; Yen, Shiao-Ping S.; and Dreyer, William J., 4,138,383, Cl. 260-29.70H.

Calvert, William L.; and Fisher, James R., to Union Carbide Corporation. Bulk material containers. 4,138,163, Cl. 302-52.000.

Calvin, Douglas G.: *See*—
Howard, Curtis E.; Calvin, Douglas G.; and Pitts, Robert W., Jr., 4,137,968, Cl. 166-53.000.

Camic, Donald L., to Hughey and Phillips, Inc. Current-level-sensitive switching system. 4,138,627, Cl. 315-313.000.

Campbell, Kenneth C.: *See*—
Swanstrom, H. Wallace; Campbell, Kenneth C.; and Schaer, Werner, 4,138,719, Cl. 364-200.000.

Canada-Cities Service, Ltd.: *See*—
Kaminsky, Victor; Trevoy, Lloyd W.; and Maskwa, Alvin, 4,138,467, Cl. 423-74.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See*—
Kaminsky, Victor; Trevoy, Lloyd W.; and Maskwa, Alvin, 4,138,467, Cl. 423-74.000.

Cannon, Thomas: *See*—
Mullins, Keith M.; Leppert, Thomas K.; Cannon, Thomas; Kerr, Ronald R.; and Smith, Ronn G., 4,138,066, Cl. 241-86.000.

Cano, Mary A. Wrap-around animal restraint. 4,137,870, Cl. 119-96.000.

Canon Kabushiki Kaisha: *See*—
Nakata, Shinichi; and Hirano, Reiji, 4,138,734, Cl. 364-710.000.

Cantley, George: *See*—
Olsen, Roger F.; and Cantley, George, 4,137,799, Cl. 74-876.000.

Capehart, Jack D.; Mazzae, John F.; and McGrew, David R. Electromagnetic detection line digitizer. 4,138,592, Cl. 178-19.000.

Capo, James L.; and Zint, Howard D., to International Paper Company. Dispensing carton. 4,138,041, Cl. 222-456.000.

Carasik, William: *See*—
McMullen, William H.; and Carasik, William, 4,138,290, Cl. 195-31.00F.

Carl Freudenberg, Firma: *See*—
Klaffke, Friedemann; and Heckel, Klaus, 4,137,575, Cl. 4-172.120.

Carl Hurth Maschinen-und Zahnradfabrik: *See*—
Behnke, Horst, 4,137,822, Cl. 90-11.00A.
Niederste-Hollenberg, Heinz; Sacher, Christoph; Fickenscher, Friedrich; and Eichinger, Johann, 4,137,862, Cl. 115-41.0HT.

Carlson, John E.; and Carlson, Richard W., to PDM Consulting and Development Corp. Collapsable brushes. 4,137,596, Cl. 15-203.000.

Carlson, Richard W., to International Paper Company. Tamperproof shipping valve. 4,137,955, Cl. 141-349.000.

Carlson, Richard W.: *See*—
Carlson, John E.; and Carlson, Richard W., 4,137,596, Cl. 15-203.000.

Carmel, Edwin L., to American Standard Inc. Gauging assembly. 4,137,643, Cl. 33-180.00R.

Carstensen, Peter: *See*—
Procida, Francesco P.; Pedersen, Svend S.; and Carstensen, Peter, 4,138,462, Cl. 264-347.000.

Cassidy, Frederick; and Wootton, Gordon, to Beecham Group Limited. 2,4 Pyrrolidinediones. 4,138,407, Cl. 260-326.330.

Castillo, Ralph D. Hair cutting guide. 4,137,925, Cl. 132-45.00R.

Castner, Kenneth F.: *See—*
Kennedy, Joseph P.; and Castner, Kenneth F., 4,138,441, Cl. 260-666.00A.

Caswell, Dwight A., Sr. Variable compression ratio piston. 4,137,873, Cl. 123-78.00B.

Cataldo, Roy S., to General Motors Corporation. Run-flat tire having internal support means. 4,137,960, Cl. 152-158.000.

Caterpillar Tractor Co.: *See—*
Crews, Donald R.; Davis, Billy J.; Treick, Roger E.; and Wellauer, John C., 4,137,982, Cl. 180-68.00R.
Gray, William E., 4,137,983, Cl. 180-69.00R.

Ceccano, Lidano, to Massey-Ferguson Services N.V. Transmission controls. 4,137,792, Cl. 74-473.00R.

Ceccon, Harry L.: *See—*
Rudis, Robert P.; and Ceccon, Harry L., 4,137,776, Cl. 73-611.000.

Cech, Karl, to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H. Headset construction. 4,138,598, Cl. 179-156.00A.

Celanese Corporation: *See—*
Brazinsky, Irving; Cooper, William M.; and Gould, Arnold S., 4,138,459, Cl. 264-154.000.
Unruh, Jerry D.; and Wells, William J., III, 4,138,420, Cl. 260-439.0CY.

Cenci, Harry J.; and Swift, Graham, to Rohm and Haas Company. Self-curing copolymers containing both hydroxyamide functions and carboxy or anhydride functions, and compositions. 4,138,541, Cl. 526-303.000.

Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement: *See—*
Gonin, Andre, 4,137,941, Cl. 137-508.000.

Ceresko, Joseph S. Headliners for caskets. 4,137,613, Cl. 27-19.000.

Cha, Charles L.; and Hou, Shou L., to Mead Corporation, The. Apparatus for producing multiple uniform fluid filaments and drops. 4,138,687, Cl. 346-75.000.

Champion International Corporation: *See—*
Alger, Richard N., 4,137,977, Cl. 177-146.000.
Dutcher, Daniel P.; and Bliss, Robert A., 4,138,012, Cl. 206-45.190.
Roccaforte, Harry I., 4,138,016, Cl. 206-620.000.
Vassiliades, Anthony E.; and Chang, Cheng H., 4,138,362, Cl. 252-316.000.
Vincent, David N.; and Golden, Ronald, 4,138,356, Cl. 252-182.000.

Chan, John K.; Tobler, Erich; and Johnson, Herbert E., to Union Carbide Corporation. Method of producing biologically active compositions. 4,138,422, Cl. 260-453.0RW.

Chang, Cheng H.: *See—*
Vassiliades, Anthony E.; and Chang, Cheng H., 4,138,362, Cl. 252-316.000.

Chang, Clarence D.; Jacob, Solomon M.; Silvestri, Anthony J.; and Zahner, John C., to Mobil Oil Corporation. Conversion of liquid alcohols and ethers with a fluid mass of ZSM-5 type catalyst. 4,138,440, Cl. 260-668.00R.

Chang, Clarence D.; and Silvestri, Anthony J., to Mobil Oil Corporation. Process for the manufacture of gasoline. 4,138,442, Cl. 260-668.00R.

Chang, David C.; Fryd, Michael; and Krueger, Achim R., to Du Pont de Nemours, E. I., and Company. Polymeric thickeners, processes for their preparation and uses thereof. 4,138,381, Cl. 260-29.6TA.

Chaveron, Michel; Sihver, Jaak-Juri; and Duperrex, Hubert, to Societe d'Assistance Technique Pour Produits Nestle S.A. Demineralization of whey. 4,138,501, Cl. 426-239.000.

Chemetals Corporation: *See—*
Sochol, Irving; and Welsh, Jay Y., 4,138,354, Cl. 252-182.000.

Chemische Werke Huels Aktiengesellschaft: *See—*
Berg, Gerhard, deceased; and Nordsiek, Karl-Heinz, 4,138,375, Cl. 260-17.00R.
Kalka, Josef; and Beckmann, Jurgen, 4,138,310, Cl. 159-47.00R.

Chen, Schoen-nan, to Optel Corporation; and Grumman Aerospace Corporation. N-methylphenazine photogalvanic cell. 4,138,532, Cl. 429-111.000.

Chevrolat, Gilbert A.; and Houyvet, Alain, to Commissariat a l'Energie Atomique. Method of forming a part of revolution having a flat shape. 4,138,286, Cl. 156-172.000.

Chevron Research Company: *See—*
Bacskai, Robert, 4,138,546, Cl. 528-312.000.
Guenther, Lloyd M., 4,138,308, Cl. 156-433.000.

Chibata, Ichiro; Tosa, Tetsuya; and Takata, Isao, to Tanabe Seiyaku Co., Ltd. Immobilized catalytically active substance and method of preparing the same. 4,138,292, Cl. 195-59.000.

Chicago Bridge & Iron Company: *See—*
McCabe, John S., 4,138,032, Cl. 220-224.000.

Child, Ralph G.: *See—*
Murdock, Keith C.; and Child, Ralph G., 4,138,415, Cl. 260-378.000.

Cho, Alfred Y., to Bell Telephone Laboratories, Incorporated. Molecular beam apparatus for processing a plurality of substrates. 4,137,865, Cl. 118-49.100.

Chodnekar, Madhukar S.; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Alkynyloxyphenyl derivatives. 4,138,579, Cl. 560-64.000.

Choi, Nam S.; and Heller, Jorge, to ALZA Corporation. Erodible agent releasing device comprising poly(orthoesters) and poly(orthocarbonates). 4,138,344, Cl. 252-1.000.

Chow, Ho, to Melnor Industries. Hose reel cart. 4,137,939, Cl. 137-355.270.

Christensen, Leon F.; and Witkowski, Joseph T., to ICN Pharmaceuticals, Inc. Process for preparing 1,2,4-triazole nucleosides. 4,138,547, Cl. 536-23.000.

Chrysler Corporation: *See—*
Sarto, Jorma O., 4,137,880, Cl. 123-119.00A.

Chrysler, Richard R. Removable roof panels for vehicles. 4,138,155, Cl. 296-137.00B.

Chu, Ke-Chiang; and Sharp, Richard S., to Burroughs Corporation. Time-shared, multi-phase memory accessing system. 4,138,720, Cl. 364-200.000.

Chylewski, Christoph; Jan, Gerald; Kurzen, Roland; Meier, Max; and Schellenberg, Matthias, to Ciba-Geigy AG. Method of processing photographic silver dye bleach materials. 4,138,256, Cl. 96-53.000.

Ciba-Geigy AG: *See—*
Chylewski, Christoph; Jan, Gerald; Kurzen, Roland; Meier, Max; and Schellenberg, Matthias, 4,138,256, Cl. 96-53.000.
Steiger, Rolf; Reber, Jean-Francois; Ezekiel, Aaron D.; and Ficken, Geoffrey E., 4,138,551, Cl. 542-435.000.

Ciba-Geigy Corporation: *See—*
Balasfalvy, Ferenc, 4,138,406, Cl. 260-326.260.
Bohner, Beat; and Baumann, Marcus, 4,138,243, Cl. 71-94.000.
Gosteli, Jacques, 4,138,451, Cl. 260-940.000.
Guglielmetti, Leonardo; Rochat, Alain C.; and Fletcher, Ian J., 4,138,429, Cl. 260-465.00H.
Hall, Luther A. R.; and Gordon, David A., 4,138,569, Cl. 548-309.000.
Hari, Stefan; Rinaldi, Ernesto; and Somlo, Josef, 4,138,568, Cl. 548-305.000.
Koller, Stefan, 4,138,396, Cl. 260-156.000.
Schlapfer-Illi, Hans, deceased, 4,138,552, Cl. 542-462.000.

Cina, Ronald A.; and Kluge, Albert D., to Roberts Corporation. Sand reclaimer. 4,137,675, Cl. 51-164.00R.

Cinque, Gregory M.: *See—*
Allocca, Michael A.; and Cinque, Gregory M., 4,138,735, Cl. 364-900.000.

Citizen Watch Co., Ltd.: *See—*
Mizukuchi, Yutaka, 4,138,359, Cl. 252-299.000.

Clarendon Press Pty. Limited: *See—*
Hayes, Francis G., 4,137,650, Cl. 35-8.00R.

Clark, James N., Jr. Heat and humidity recovery device for use with clothes dryer. 4,137,647, Cl. 34-82.000.

Clarke, John M., to Noel Penny Turbines Limited. Engine in which fuel is reacted in a plurality of stages. 4,137,706, Cl. 60-39.120.

Clarke, Ronald L. C.; and Savage, Donald S., to Aerpat A.G. Collector for broken-off fastener parts. 4,137,747, Cl. 72-391.000.

Clemens, John E., to Tesseract Corporation. Ammunition handling and loading system. 4,137,820, Cl. 89-33.0BB.

Clive Investments Pty Limited: *See—*
Cowdroy, Thorp C., 4,138,176, Cl. 312-341.0NR.

Coal Industry (Patents) Limited: *See—*
Pidgeon, Brian G.; and Dowell, Joseph, 4,138,010, Cl. 198-573.000.

Coe, Charles G.: *See—*
Uffner, Melville W.; Jefferson, Donald E.; Coe, Charles G.; and Beitchman, Burton D., 4,138,385, Cl. 260-40.00R.

Cohen, Milton J. Syringe filter unit. 4,137,917, Cl. 128-218.00R.

Colas, Daniel: *See—*
Girault, Herve; and Colas, Daniel, 4,138,726, Cl. 364-521.000.

Cole, Edward L.: *See—*
Herbstman, Sheldon; Cole, Edward L.; and Estes, John H., 4,138,444, Cl. 260-683.470.

Colgate Palmolive Company: *See—*
Gaffar, Maria Corazon S., 4,138,477, Cl. 424-52.000.

Collins, Donald L.: *See—*
Rohrs, Donald L.; Downing, Harold A.; and Collins, Donald L., 4,138,023, Cl. 214-75.00R.

Collins Industries, Inc.: *See—*
Rohrs, Donald L.; Downing, Harold A.; and Collins, Donald L., 4,138,023, Cl. 214-75.00R.

Collins, Jack. Portable steam bath. 4,137,574, Cl. 4-160.000.

Colombo, Edward A.; Johnson, David E.; and Tsai, James T., to Mobil Oil Corporation. Melt rheometer for the measurement of flow properties of foamable plastics and polymer compositions. 4,137,754, Cl. 73-56.000.

Colonial Metals, Inc.: *See—*
Davies, Ronald F.; and Manly, John P., 4,138,220, Cl. 422-173.000.

Columbia Scientific Industries, Inc.: *See—*
Rhodes, John R.; Sieberg, Robert D.; Taylor, Morris C.; Westkaemper, John C.; and Young, Robert C., 4,137,751, Cl. 73-28.000.

Columbus McKinnon Corporation: *See—*
Schreyer, Kenneth D., 4,137,704, Cl. 59-86.000.

Colvert, James H.; MacLean, John P.; Williams, Dale; and Jones, Henry B., to Texaco Inc. Apparatus for the regeneration of solid catalyst. 4,138,219, Cl. 422-144.000.

Colwill, John A., to Square D Company. Proximity switch. 4,138,709, Cl. 361-180.000.

Combustion Engineering, Inc.: *See—*
McGee, John K., 4,138,091, Cl. 251-267.000.

Comer, Donald T.; Dooley, Daniel J.; and Schoeff, John A., to Precision Monolithics, Inc. Selectable trimming circuit for use with a digital to analog converter. 4,138,671, Cl. 340-347.0DA.

Commissariat a l'Energie Atomique: *See—*
Chevrolat, Gilbert A.; and Houyvet, Alain, 4,138,286, Cl. 156-172.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Esdaile, James D.; Whitehead, Alan B.; Walters, Graeme W.; and Denholm, William T., 4,138,247, Cl. 75-79.000.

Communications Satellite Corporation: *See—*
Ali, M. Zaheer, 4,138,730, Cl. 364-726.000.

Compagnie Francaise des Petroles "TOTAL": *See—*
Edison, David M.; Marton, Fred S.; and Ucovich, John N., 4,138,669, Cl. 340-147.00R.
Compagnie Honeywell Bull: *See—*
Magnenet, Jean G., 4,138,702, Cl. 360-125.000.
Conforti, Frederick J.; Schwarzbach, Richard J.; and Schneider, Quentin L., to Pittway Corporation. Warning device. 4,138,664, Cl. 340-507.000.
Conklin, Charles S., to Owens-Illinois, Inc. Plastic package with heat shrunk sleeve. 4,138,026, Cl. 215-12.00R.
Connor, David T.; Ringel, Samuel M.; Roemer, Sidney; and Von Strandtmann, Maximillian, to Warner-Lambert Company. Diacyloxyacids derived from acid S, an antibiotic produced by *Polyangium cellulosum* var. *fulvum*. 4,138,550, Cl. 542-430.000.
Container Corporation of America: *See—*
Gardner, Jeffrey M., 4,138,053, Cl. 229-23.00R.
Zicko, James A., 4,138,051, Cl. 229-17.00B.
Continental Group, Inc., The: *See—*
Payne, Robert D., 4,138,161, Cl. 302-28.000.
Continental Oil Company: *See—*
Gorin, Everett, 4,138,221, Cl. 44-10.00C.
Gorin, Everett, 4,138,222, Cl. 44-10.00C.
Gorin, Everett, 4,138,223, Cl. 44-10.00C.
Gorin, Everett, 4,138,224, Cl. 44-23.000.
Contronic Controls Limited: *See—*
Humphries, Peter E., 4,138,674, Cl. 340-506.000.
Conway, Walter D.: *See—*
Minatoya, Hiroaki; Tullar, Benjamin F.; and Conway, Walter D., 4,138,581, Cl. 560-109.000.
Cook, Martin C.; Gregory, Gordon I.; and Bradshaw, Janice, to Glaxo Laboratories, Limited. (6R,7R)-7-[2-aryl-2-(etherified oximino)acetamido]-3-carbamoyloxymethylceph-3-em-4-carboxylic acid 1-oxides. 4,138,555, Cl. 544-22.000.
Cooper, John F.: *See—*
Frankel, Donald P.; Kendall, Willard E.; and Cooper, John F., 4,138,331, Cl. 210-63.00R.
Cooper, William M.: *See—*
Brazinsky, Irving; Cooper, William M.; and Gould, Arnold S., 4,138,459, Cl. 264-154.000.
Copal Company Limited: *See—*
Yaginuma, Jusuke, 4,137,703, Cl. 58-16.00D.
Corbett, David F.: *See—*
Howarth, Thomas T.; Brown, Allan G.; Corbett, David F.; and Ponsford, Roger J., 4,138,403, Cl. 260-307.0FA.
Cordis Dow Corp.: *See—*
Tigner, Reuben A., 4,138,460, Cl. 264-159.000.
Cornils, Boy: *See—*
Tummes, Hans; Noeske, Heinz; Cornils, Boy; and Kascha, Waldemar, 4,138,588, Cl. 568-881.000.
Corning Glass Works: *See—*
Bonzo, Roy T.; and Knowles, Daniel H., 4,138,069, Cl. 242-18.00A.
Corsmeier, Robert J.: *See—*
Andersen, Richard H.; Corsmeier, Robert J.; Rauf, James P.; and Lenahan, Dean T., 4,137,705, Cl. 60-39.080.
Cosack, Claus; Hein, Wolfgang; Hese, Nils; Neumann, Manfred; and Willemer, Wilhelm. High pressure membrane test cell. 4,137,756, Cl. 73-64.300.
Cotrel, Claude: *See—*
Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,138,487, Cl. 424-250.000.
Cousins, Charles P., to EMI Limited. Measuring arrangements for electrical currents. 4,138,640, Cl. 324-76.00A.
Couture, Fernand; and Allard, Rene. Vegetable peeling apparatus. 4,137,839, Cl. 99-541.000.
Coval, Arthur B.: *See—*
Lee, Arthur L.; and Coval, Arthur B., 4,138,001, Cl. 188-170.000.
Cowdroy, Thorp C., to Clive Investments Pty Limited. Drawer mounting arrangement. 4,138,176, Cl. 312-341.0NR.
Cox, Bernd: *See—*
Adrian, Renate; von Schenck, Raban; Cox, Bernd; and Wirtz, Peter, 4,138,261, Cl. 106-84.000.
Cox, Richard E., to Dealey & Burrow Limited; and Whippendell Electrical Manufacturing Company. Cutting tool arrangement for use in a lathe. 4,137,802, Cl. 82-11.000.
Cox, Robert N.; and Bodoh, Albinus G., to UMC Industries, Inc. Vendor having sliding trays and latches therefor. 4,138,174, Cl. 312-333.000.
Crawford, Wheeler C., to Texaco Inc. Synthetic diester lubricating oils containing overbased calcium sulfonates and nonylphenol ethyleneoxide adducts. 4,138,347, Cl. 252-33.000.
Cremona, Angelo. Wood stock support construction for a blade holder and bar carrying unit of a vertical type wood shearing machine. 4,137,957, Cl. 144-178.000.
Crenshaw, Ronnie R.; Luke, George M.; and Partyka, Richard A., to Bristol-Myers Company. Cyanocarboxamidines and quinazoline process. 4,138,561, Cl. 544-284.000.
Creusot-Loire: *See—*
Leroy, Pierre, 4,138,098, Cl. 266-268.000.
Creusot-Loire Vallourec: *See—*
Mola, Michel, 4,137,961, Cl. 164-49.000.
Crews, Donald R.; Davis, Billy J.; Treick, Roger E.; and Wellauer, John C., to Caterpillar Tractor Co. Reinforced radiator mounting for heavy vehicles. 4,137,982, Cl. 180-68.00R.
Criss, William H. Ski board. 4,138,128, Cl. 280-16.000.
Crivello, James V., to General Electric Company. Photo-curing method for epoxy resin using group VIa onium salt. 4,138,255, Cl. 96-35.100.
Croix-Marie, Francis J., to Bertin & Cie. System for sealing the gap between a surface and a wall edge opposite it. 4,137,988, Cl. 180-130.000.
Cruthers, Larry R.: *See—*
Haugwitz, Rudiger D.; Cruthers, Larry R.; and Maurer, Barbara V., 4,138,493, Cl. 424-273.00B.
Culpepper, Jesse L., to TRW Inc. Control valve. 4,137,933, Cl. 137-219.000.
Cunha, Daniel, to United States of America, Navy. Rocket engine mount. 4,137,848, Cl. 102-49.500.
Currie, Robert M., to Du Pont de Nemours, E. I., and Company. Process for manufacturing shaped polyester article using scrap materials. 4,138,374, Cl. 260-2.300.
Cutler-Hammer, Inc.: *See—*
Parato, Vito J., 4,138,645, Cl. 325-363.000.
Parato, Vito J., 4,138,646, Cl. 325-363.000.
Cutler, Ivan B.: *See—*
Shaikh, Mohammed N.; Cutler, Ivan B.; Virkar, Anil V.; and Gordon, Ronald S., 4,138,455, Cl. 264-56.000.
Cutter Laboratories, Inc.: *See—*
Hunger, Darrell M.; McGill, Lee E.; and von Alven, Raymond D., 4,138,105, Cl. 272-99.000.
Cutts, Ronald G., to W. A. Deutsher Pty. Ltd. Gas tap. 4,137,945, Cl. 137-625.460.
Cyprus Metallurgical Processes Corporation: *See—*
Narain, Kartik A., 4,138,248, Cl. 75-101.00R.
Cyrot, Luc P., to Parker-Hannifin Corporation. Device for controlling hydraulic motors. 4,138,088, Cl. 251-30.000.
D. H. Baldwin Company: *See—*
Bunger, David A., 4,137,809, Cl. 84-1.030.
Daebler, Donald H.; and Morgan, John H., to GTE Automatic Electric Laboratories, Inc. Apparatus and method for sorting substrates. 4,138,018, Cl. 209-633.000.
Dai-Ichi Croda Chemicals Kabushiki Kaisha: *See—*
Koresawa, Takeshi; and Yoden, Eiji, 4,138,416, Cl. 260-397.250.
Dai Nippon Toryo Co., Ltd.: *See—*
Mori, Etsuo; Shimiya, Keiji; Miura, Norio; and Suzuki, Yujiro, 4,138,529, Cl. 428-539.000.
Daicel Ltd.: *See—*
Nagatugi, Shuzo; Miyagawa, Akira; and Fukuoka, Suguru, 4,138,225, Cl. 44-42.000.
Daiichi Seiyaku Co., Ltd.: *See—*
Ishikawa, Fumiyoshi; Kosasayama, Akira; Watanabe, Yoshifumi; Abiko, Yasushi; Kameda, Kin-ya; and Ono, Shin-etu, 4,138,491, Cl. 424-263.000.
Daikin Kogyo Co., Ltd.: *See—*
Watada, Masahiro, 4,137,726, Cl. 62-196.00C.
Daitzman, Reid. Board game. 4,138,120, Cl. 273-271.000.
Dalrymple, William P. Orbiting piston rotary engine. 4,137,891, Cl. 123-245.000.
Dalton, John A. Golf club head. 4,138,117, Cl. 273-164.000.
Daly, Betty M. Rollover stretcher. 4,137,581, Cl. 5-82.00R.
D'Amicis, William C. Swing brake system. 4,138,104, Cl. 272-85.000.
Darroch, Lloyd R., to Aakronite Decoratives Limited. Structural article with molded protective exposed surface. 4,138,524, Cl. 428-217.000.
Das, Naba K., to W. R. Grace & Co. Ruminant feed additive. 4,138,498, Cl. 426-2.000.
Davidson, Allen L.; and Durante, James M., to Motorola, Inc. Portable radio antenna. 4,138,681, Cl. 343-702.000.
Davies, Ronald F.; and Manly, John P., to Colonial Metals, Inc. Apparatus for catalytic oxidation of grease and fats in low temperature fumes. 4,138,220, Cl. 422-173.000.
Davis, Billy J.: *See—*
Crews, Donald R.; Davis, Billy J.; Treick, Roger E.; and Wellauer, John C., 4,137,982, Cl. 180-68.00R.
Davis, Geoffrey E.: *See—*
Miller, Robert A.; and Davis, Geoffrey E., 4,138,629, Cl. 318-140.000.
Davis, Gerald T.: *See—*
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., 4,138,508, Cl. 427-54.000.
Davis, Newton G.; Hammond, James W.; and Loomis, Phillip E., to AMP Incorporated. Apparatus for inserting wires into terminals in a connector. 4,137,624, Cl. 29-566.100.
Day, Christopher C.: *See—*
Jansen, William D.; Haney, Jerry D.; Day, Christopher C.; and Schneeberger, Stephen A., 4,137,907, Cl. 128-2.05M.
Dayco Corporation: *See—*
Waugh, Dale L., 4,137,787, Cl. 74-233.000.
Dealey & Burrow Limited: *See—*
Cox, Richard E., 4,137,802, Cl. 82-11.000.
Deaton, Homer W.: *See—*
Bright, James A.; and Deaton, Homer W., 4,137,735, Cl. 68-18.00D.
Decker, Raymond E., to Smith International, Inc. Hydraulically driven kelly crowd. 4,137,974, Cl. 173-147.000.
Deere & Company: *See—*
Pratt, Ronald L., 4,137,852, Cl. 111-57.000.
Deets, Gary L.; and Shapras, Peter, to Monsanto Company. Nitrogenous polymer compositions. 4,138,447, Cl. 260-876.00R.
De Freze, William E. Demountable truck bed load-supporting rack. 4,138,046, Cl. 224-42.42R.
Degonde, Jean; Freschard, Regis; and de Poulepiquet, Louis, to Assistance Technique Medicale Serdal S.A. Societe anonyme. Apparatus

for observing cardiac rhythm free of interfering effects. 4,137,908, Cl. 128-2.06R.

Dehais, Claude, to Sotapharm. Machine for manufacturing ampullae, particularly pharmaceutical ampullae. 4,138,240, Cl. 65-280.000.

De Jaeger, Nikolaas C.: *See*—
Gilliams, Yvan K.; De Volder, Noel J.; Pollet, Robert J.; Tavernier, Bernard H.; De Jaeger, Nikolaas C.; and Sels, Francis J., 4,138,351, Cl. 252-62.10L.

Delmar Chemicals Limited: *See*—
Kubela, Rudolf; Musil, Vaclav; and Hughes, Lisc A., 4,138,494, Cl. 424-274.000.

De Lorme, James F.; and Tuppen, Arthur R., to International Telephone and Telegraph Corporation. Selective sampling method. 4,138,680, Cl. 343-105.00R.

Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. Heavy duty conveyor. 4,138,008, Cl. 198-365.000.

DeLuca, Raymond F.; and Jespersen, Paul W., to Georgia-Pacific Corporation. Dispenser for flexible sheet material. 4,137,805, Cl. 83-345.000.

de Man, Heiko T.: *See*—
Stone, Thomas D.; Felgen, Michael J.; and de Man, Heiko T., 4,137,813, Cl. 84-314.000.

Dembowski, Ronald J.; and Werbil, David O., to Ball Corporation. Peroxide vulcanized W-type chloroprene. 4,138,537, Cl. 526-47.800.

Den Boer, Jan B.: *See*—
Middelbeek, Cornelis G.; Wolters, Tjako A.; and Den Boer, Jan B., 4,138,342, Cl. 210-522.000.

Denholm, William T.: *See*—
Esdaile, James D.; Whitehead, Alan B.; Walters, Graeme W.; and Denholm, William T., 4,138,247, Cl. 75-79.000.

Dennison Manufacturing Company: *See*—
Wood, William E., 4,137,606, Cl. 24-16.0PB.

de Nora, Oronzio: *See*—
DeNora, Vittorio; and de Nora, Oronzio, 4,138,295, Cl. 204-98.000.

DeNora, Vittorio; and de Nora, Oronzio, to Diamond Shamrock Technologies S.A. Process and apparatus for downward recycling of the electrolyte in diaphragm cells. 4,138,295, Cl. 204-98.000.

de Poulepiquet, Louis: *See*—
Degonde, Jean; Freschard, Regis; and de Poulepiquet, Louis, 4,137,908, Cl. 128-2.06R.

Depp, Steven W.: *See*—
McCormick, J. Byron; Depp, Steven W.; Hamilton, Douglas J.; and Kerwin, William J., 4,138,622, Cl. 313-306.000.

Dernedde, Robert; and Schneider, Wolfgang, to KSB Kernkraftwerkspumpen GmbH. Pump for use in nuclear reactor plants and anchoring means therefor. 4,138,201, Cl. 415-219.00C.

Dettmann, Eileen A.; and Thomas, Arthur J. Identification holders for dogs and cats. 4,137,660, Cl. 40-303.000.

Deutsche Texaco Aktiengesellschaft: *See*—
Grasshoff, Hans D., 4,138,348, Cl. 252-42.100.

De Volder, Noel J.: *See*—
Gilliams, Yvan K.; De Volder, Noel J.; Pollet, Robert J.; Tavernier, Bernard H.; De Jaeger, Nikolaas C.; and Sels, Francis J., 4,138,351, Cl. 252-62.10L.

Devro, Inc.: *See*—
Ziolko, Francis J., 4,138,503, Cl. 426-514.000.

Dewey, James E.: *See*—
Fulger, Charles V.; and Dewey, James E., 4,138,500, Cl. 426-46.000.

Dexter Corporation, The: *See*—
Neumann, Daniel L., 4,138,384, Cl. 260-29.70S.

Dial, Emily C. Geometric iridescent image. 4,138,515, Cl. 428-30.000.

Diamond International Corporation: *See*—
Grogan, Richard P., 4,138,038, Cl. 222-207.000.

Diamond Shamrock Corporation: *See*—
Meyer, Lewis M., 4,138,324, Cl. 204-284.000.

Diamond Shamrock Technologies S.A.: *See*—
DeNora, Vittorio; and de Nora, Oronzio, 4,138,295, Cl. 204-98.000.

Dickson, Arthur D., to Minnesota Mining and Manufacturing Company. Multi-panel electroluminescent light assembly. 4,138,620, Cl. 313-1.000.

Diehl GmbH & Co.: *See*—
Weidner, Peter F., 4,137,851, Cl. 102-218.000.

Dierssen, Gunther H.: *See*—
Kampfer, Robert D.; and Dierssen, Gunther H., 4,138,211, Cl. 431-35.000.

Dietrich, Johann, to Universal Bricklaying Systems Pty. Ltd. Profile system for walls and bracket therefor. 4,137,636, Cl. 33-85.000.

Director General of Agency of Industrial Science and Technology: *See*—
Kiyomiya, Makoto; and Kawai, Misao, 4,138,368, Cl. 252-470.000.

Diver's Exchange Inc.: *See*—
O'Neill, Wilbur J., 4,137,912, Cl. 128-142.300.

D'Luhy, Emil A., to Moore Business Forms, Inc. Method of making a stubless multi-ply assembly. 4,138,302, Cl. 156-216.000.

Dmitriev, Mikhail E.: *See*—
Vereschagin, Leonid F.; Semerchian, Aik A.; Gankevich, Tamara T.; Dmitriev, Mikhail E.; and Modenov, Vitaly P., 4,138,252, Cl. 75-244.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Srock, Rainer; and Ziegler, Hermann, 4,138,513, Cl. 427-371.000.

Doherty, R. Michael. Cubical quad antennas with spreader-reinforced crossarms. 4,138,682, Cl. 343-742.000.

Doi, Toshitada; and Iga, Akira, to Sony Corporation. Video signal recorder/reproducer for recording and reproducing pulse signals. 4,138,694, Cl. 358-127.000.

Doi, Tsunesuke: *See*—
Ishijima, Shizuo; and Doi, Tsunesuke, 4,138,270, Cl. 106-291.000.

Doll, Joseph D., to Lockwood Corporation. Over-power safety device for motor driven system. 4,138,705, Cl. 361-42.000.

Donner, Egon F., to United States of America, Navy. Destruct initiation unit. 4,137,850, Cl. 102-215.000.

Donze, William A.: *See*—
Toke, Ronald J.; and Donze, William A., 4,138,718, Cl. 364-200.000.

Dooley, Daniel J.: *See*—
Comer, Donald T.; Dooley, Daniel J.; and Schoeff, John A., 4,138,671, Cl. 340-347.0DA.

Doonan, R. Dean. Hole plug for insulated injection wall holes. 4,137,680, Cl. 52-127.000.

Dorius, John O., to Elsters, Inc. Exhaust hood employing a venturi slot. 4,137,904, Cl. 126-299.00D.

Doss, Richard C., to Phillips Petroleum Company. Liquid polyalkene in thermoplastic elastomer sealant formulation. 4,138,378, Cl. 260-27.0BB.

Dostert, Philippe, to Hoffmann-La Roche Inc. 3-Cyano-N-(N,N-dimethylaminopropyl)-iminodibenzyl and salts thereof. 4,138,482, Cl. 424-244.000.

Dotter, Klaus: *See*—
Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, 4,138,593, Cl. 179-1.00E.

Dow Chemical Company, The: *See*—
Heckeroth, Earl T., 4,138,208, Cl. 425-71.000.
Laflin, George P.; and Durborow, Clarence J., 4,137,970, Cl. 166-292.000.
Teot, Arthur S.; Hamlin, Percy J.; and Savage, Albert B., 4,138,352, Cl. 252-135.000.

Dow Corning Corporation: *See*—
Polmanteer, Keith E., 4,138,382, Cl. 260-29.6TA.

Dowd, Daniel J., to Westvaco Corporation. Reeled web unwind stand. 4,138,073, Cl. 242-58.200.

Dowell, Joseph: *See*—
Pidgeon, Brian G.; and Dowell, Joseph, 4,138,010, Cl. 198-573.000.

Downing, Harold A.: *See*—
Rohrs, Donald L.; Downing, Harold A.; and Collins, Donald L., 4,138,023, Cl. 214-75.00R.

Downing, Robert D.; and Sobieski, John C., to General Electric Company. Short-arc discharge lamp with starting device. 4,138,621, Cl. 313-113.000.

Doyle, Keith H. Protective covers for motorcycle lower fork cases and method of making same. 4,138,132, Cl. 280-289.00G.

Dreyer, William J.: *See*—
Rembaum, Alan; Yen, Shiao-Ping S.; and Dreyer, William J., 4,138,383, Cl. 260-29.70H.

Drogichen, Daniel P. Self-contained relocatable memory subsystem. 4,138,738, Cl. 365-94.000.

Droste, Gunter: *See*—
Stapel, Wilhelm; Droste, Gunter; and Seiler, Klaus-Dieter, 4,137,858, Cl. 112-181.000.

Druffel, Donald G.; and Druffel, James E. Chaff spreading attachment for harvesters. 4,137,923, Cl. 130-27.00R.

Druffel, James E.: *See*—
Druffel, Donald G.; and Druffel, James E., 4,137,923, Cl. 130-27.00R.

D'Silva, Themistocles D. J., to Union Carbide Corporation. N-dithio carbamoyl oximes. 4,138,423, Cl. 260-453.0RW.

Du Pont of Canada Limited: *See*—
Wolstencroft, Michael J., 4,137,614, Cl. 28-172.000.

Dunn, Stephen J., to Perkins Engines Limited. Pistons for internal combustion engines. 4,137,887, Cl. 123-193.00P.

Duperrex, Hubert: *See*—
Chaveron, Michel; Sihver, Jaak-Juri; and Duperrex, Hubert, 4,138,501, Cl. 426-239.000.

Du Pont de Nemours, E. I., and Company: *See*—
Adams, Charles D., 4,138,585, Cl. 560-159.000.
Beasley, John K.; Beckerbauer, Richard; Schleinitz, Henry M.; and Wilson, Frank C., 4,138,194, Cl. 350-96.300.
Chang, David C.; Fryd, Michael; and Krueger, Achim R., 4,138,381, Cl. 260-29.6TA.
Currie, Robert M., 4,138,374, Cl. 260-2.300.
England, David C., 4,138,426, Cl. 260-465.600.
Goddard, Steven J., 4,138,242, Cl. 71-92.000.
Stiles, Alvin B.; and England, David C., 4,138,430, Cl. 260-465.900.

Durante, James M.: *See*—
Davidson, Allen L.; and Durante, James M., 4,138,681, Cl. 343-702.000.

Durborow, Clarence J.: *See*—
Laflin, George P.; and Durborow, Clarence J., 4,137,970, Cl. 166-292.000.

Durkoppwerke GmbH: *See*—
Stapel, Wilhelm; Droste, Gunter; and Seiler, Klaus-Dieter, 4,137,858, Cl. 112-181.000.

Durville, Gerard, to Vanguard Supreme Machine Corporation. Cam track for a circular knitting machine. 4,137,728, Cl. 66-57.000.

Dutcher, Daniel P.; and Bliss, Robert A., to Champion International Corporation. Carton for holding and displaying a stacked array of flat rectangular boxes. 4,138,012, Cl. 206-45.190.

Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Kern, Georg, 4,137,686, Cl. 52-734.000.

Dyment, John C., to Northern Telecom Limited. Method of producing optoelectronic devices with control of light propagation by proton bombardment. 4,138,274, Cl. 148-1.500.

Dynamit Nobel Aktiengesellschaft: *See—*
Janssen, Paul, deceased; Meyer, Gunther; Thewalt, Klaus; and Schmidt, Reinhard, 4,138,544, Cl. 528-272.000.
Schultz, Neithart; Vahlensieck, Hans-Joachim; and Martens, Peter, 4,138,439, Cl. 260-653.600.

Dynapol: *See—*
Wang, Patricia C.; and Wingard, Robert E., Jr., 4,138,409, Cl. 260-327.00S.

E. Gordon Whiteley Limited: *See—*
Rhodes, Eric S., 4,137,648, Cl. 34-86.000.

E. R. Squibb & Sons, Inc.: *See—*
Hauck, Frederic P.; Sundeen, Joseph E.; and Reid, Joyce, 4,138,497, Cl. 424-305.000.
Haugwitz, Rudiger D.; Cruthers, Larry R.; and Maurer, Barbara V., 4,138,493, Cl. 424-273.00B.

Eakin Fruit Company: *See—*
Eakin, William F., 4,138,675, Cl. 340-596.000.

Eakin, William F., to Eakin Fruit Company. Freezing point monitoring system for fruit trees and the like. 4,138,675, Cl. 340-596.000.

Earl, William C.: *See—*
Russillo, Joseph G.; and Earl, William C., 4,138,697, Cl. 360-6.000.

Eastman Kodak Company: *See—*
Shiao, Daniel D., 4,138,265, Cl. 96-114.100.

Eaton Corporation: *See—*
Jaeschke, Ralph L., 4,138,618, Cl. 310-105.000.

Ebauches S.A.: *See—*
Saurer, Eric; and Grimm, Maurice, 4,138,195, Cl. 350-345.000.

Eckerdt, George H. Key mount. 4,137,740, Cl. 70-45.0CR.

ECM Motor Company: *See—*
Bostrom, Harry H., 4,137,796, Cl. 74-625.000.

Eddy, Michael A. Perpetual calendar. 4,137,659, Cl. 40-107.000.

Edge, Charles K.: *See—*
Nier, Thomas J.; and Edge, Charles K., 4,138,239, Cl. 65-182.00R.

Edison, David M.; Marton, Fred S.; and Ucovich, John N., to Compagnie Francaise des Petroles "TOTAL". Remote monitoring and controlling system for subsea oil/gas production equipment. 4,138,669, Cl. 340-147.00R.

Edwards, David C.: *See—*
Ehrgott, Charles W.; and Edwards, David C., 4,138,502, Cl. 426-385.000.

Edwards, Douglas C., to Polysar Limited. Polymeric antioxidants. 4,138,389, Cl. 260-45.70R.

Edwards, Harrison F., to Sunbeam Corporation. Fireplace enclosure and heat-exchanger unit. 4,137,896, Cl. 126-140.000.

Eggert, John N.; Herrington, Richard A.; and Oelke, Waldemar W., to Libbey-Owens-Ford Company. Method of and apparatus for shaping and heat treating glass sheets. 4,138,237, Cl. 65-104.000.

Eguchi, Masao: *See—*
Yamasaki, Toshiharu; Eguchi, Masao; Uchiumi, Schinichiro; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, 4,138,587, Cl. 560-204.000.

Eguchi, Toru: *See—*
Tadakuma, Yuji; Saito, Syunji; and Eguchi, Toru, 4,138,733, Cl. 364-900.000.

Ehret, Gordon F.; and Rowley, William N., to Wylain, Inc. Motor supporting platform. 4,138,079, Cl. 248-558.000.

Ehrgott, Charles W.; and Edwards, David C., to General Foods Corporation. Method of producing a darkened freeze-dried coffee. 4,138,502, Cl. 426-385.000.

Ehrhardt, Lothar; Patt, Ludwig; and Hartmann, Volker, to Sandoz Ltd. Stable solutions and process for their preparation. 4,138,565, Cl. 544-346.000.

Eichelberger, Charles W.; and Butler, Walter J., to General Electric Company. Preamplifier for analog to digital converters. 4,138,665, Cl. 340-347.0NT.

Eichelberger, Charles W.; and Butler, Walter J., to General Electric Company. Charge transfer circuit with threshold voltage compensating means. 4,138,666, Cl. 340-347.0CC.

Eichinger, Johann: *See—*
Niederste-Hollenberg, Heinz; Sacher, Christoph; Fickenscher, Friedrich; and Eichinger, Johann, 4,137,862, Cl. 115-41.0HT.

Eida, Toshiaki; Saito, Yasuhiro; Saito, Tomiji; Yomoto, Chobe; and Nakajima, Yutaka, to Meiji Seika Kaisha, Ltd. Method for deodorizing soybean milk obtained from soybeans or defatted soybeans. 4,138,506, Cl. 426-598.000.

Einarsson, Gudrun M.: *See—*
Andersson, Lars-Olov; Einarsson, Gudrun M.; and Kaplan, Lennart P., 4,138,287, Cl. 195-1.500.

Electric Power Research Institute, Inc.: *See—*
Sisk, Francis J.; and Fagan, Thomas J., 4,137,798, Cl. 74-812.000.

Eley, Edgar R., to Westinghouse Electric Corp. Over-center toggle switch. 4,138,602, Cl. 200-67.00R.

Eller, J. Marlin. Hydraulic motor system for driving a submersible impeller pump in which reversal of hydraulic flow is prevented. 4,138,202, Cl. 417-47.000.

Elliott, Robert L.; and Gardiner, J. Brooke, to Exxon Research & Engineering Co. Multipurpose lubricating oil additive based on electrophilically terminated anion of oxidized ethylene copolymer. 4,138,370, Cl. 252-51.50A.

Elsters, Inc.: *See—*
Dorius, John O., 4,137,904, Cl. 126-299.00D.

Emerson Electric Co.: *See—*
Schaffer, Gregory L., 4,138,649, Cl. 330-9.000.

EMI Limited: *See—*
Cousins, Charles P., 4,138,640, Cl. 324-76.00A.
Hounsfield, Godfrey N., 4,138,611, Cl. 250-445.00T.
LeMay, Christopher A. G., 4,137,775, Cl. 73-602.000.

Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., to Rohm and Haas Company. Vinyl resin coating compositions comprising dicyclopentenyl acrylate and/or methacrylate vehicular component. 4,138,390, Cl. 260-45.90L.

Emmons, William D.; and Stevens, Travis E., to Rohm and Haas Company. Oxazolidine-terminated polyesters. 4,138,545, Cl. 528-289.000.

Endo, Takaya: *See—*
Wada, Hajime; Kimura, Kazuhiko; Hori, Haruo; Kikuchi, Shoji; and Endo, Takaya, 4,138,264, Cl. 96-100.00R.

Endoh, Takeshi; and Takayasu, Mitsuru, to Fujitsu Limited. Card handling device. 4,138,059, Cl. 235-483.000.

Energy Conversion Devices, Inc.: *See—*
Wacks, Harvey H.; Izu, Masatsugu; and Sarrach, Donald J., 4,138,262, Cl. 96-87.00R.

Engelbart, Wilhelm; and Nahr, Dieter, to Euro Pressing Group Limited. Apparatus for pressing trousers. 4,137,655, Cl. 38-12.000.

Engelhart, John E.: *See—*
Gitlitz, Melvin H.; Engelhart, John E.; and Mery, Carlos M., 4,138,483, Cl. 424-245.000.

Engelmann, Rudolph H., to Pako Corporation. Dual priority temperature control. 4,138,607, Cl. 219-485.000.

Engineered Products, Inc.: *See—*
Baker, Robert A., 4,138,045, Cl. 224-5.00V.

England, David C., to Du Pont de Nemours, E. I., and Company. Alkyl perfluoro-ω-fluoroformyl esters and monomers therefrom. 4,138,426, Cl. 260-465.600.

England, David C.: *See—*
Stiles, Alvin B.; and England, David C., 4,138,430, Cl. 260-465.900.

Englehart, Clem C. Materials handling device. 4,138,099, Cl. 269-17.000.

Engler, Peter; and Heller, Georg, to MADAG Maschinen - und Apparatebau Dietikon AG. Pattern device for a knitting machine. 4,137,729, Cl. 66-75.100.

Enzinger-Union-Werke AG: *See—*
Brill, Karl H.; Schenk, Gerhard; and Weinlich, Rudolf, 4,137,954, Cl. 141-90.000.

Equipment Renewal Company: *See—*
Hardcastle, Philip P., 4,137,946, Cl. 138-103.000.

Erbe Elektromedizin KG: *See—*
Farin, Gunter; and Posselt, Gunther, 4,137,919, Cl. 128-303.170.

Erlikh, Mikhail I.: *See—*
Muratov, Rustem I.; Kot, Jury D.; Belov, Mikhail F.; Gildengorn, Melis S.; Konkov, Vyacheslav S.; and Erlikh, Mikhail I., 4,137,745, Cl. 72-263.000.

Erma-Werke Waffen- und Maschinenfabrik GmbH: *See—*
Krauss, Dieter, 4,137,618, Cl. 29-149.50S.

Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Rolling bearing including lengthwise convex race rails. 4,138,167, Cl. 308-6.00C.

Ernst Schweizer AG, Metallbau Zurich: *See—*
Arnhold, Franz; and Husner, Walter, 4,137,746, Cl. 72-389.000.

Eschenbach, Paul W., to Milliken Research Corporation. Device for scrubbing surfaces. 4,137,601, Cl. 15-380.000.

Esdaile, James D.; Whitehead, Alan B.; Walters, Graeme W.; and Denholm, William T., to Commonwealth Scientific and Industrial Research Organization. Method for promoting solids-liquid flow. 4,138,247, Cl. 75-79.000.

Esterhammer, Josef: *See—*
Utz, Kastulus; Esterhammer, Josef; and Hakl, Heinz, 4,137,688, Cl. 53-432.000.

Estes, John H.: *See—*
Herbstman, Sheldon; Cole, Edward L.; and Estes, John H., 4,138,444, Cl. 260-683.470.

Etablissement Public dit "Centre National pour l'Exploitation des Oceans": *See—*
Avedik, Felix; and Renard, Vincent, 4,138,658, Cl. 340-7.00R.

Etablissements Chalon-Megard (Societe Anonyme): *See—*
Megard, Pierre, 4,137,836, Cl. 99-454.000.

Ethicon, Inc.: *See—*
Okuzumi, Yuzi; Mellon, A. Darline; and Wasserman, David, 4,137,921, Cl. 128-335.500.

Euracom S.A.: *See—*
Apellaniz, Ramon, 4,138,092, Cl. 251-325.000.

Euro Pressing Group Limited: *See—*
Engelbart, Wilhelm; and Nahr, Dieter, 4,137,655, Cl. 38-12.000.

Evans, William P.; and Naik, Appayya R., to Lever Brothers Company. Detergent composition. 4,138,435, Cl. 260-567.60M.

Everett/Charles, Inc.: *See—*
Long, Everett J.; and Muench, Elmer W., 4,138,186, Cl. 339-117.00P.

Evers, William J.: *See—*
Mookherjee, Braja D.; Evers, William J.; and Goossens, Alfred E., 4,138,413, Cl. 260-347.200.

Evert, Karla R., to Stearns Manufacturing Company. Survival suit. 4,137,586, Cl. 9-341.000.

Exxon Production Research Company: *See—*
Shaughnessy, Christopher M.; and Salathiel, William M., 4,137,971, Cl. 166-295.000.

Exxon Research & Engineering Co.: *See—*
Elliott, Robert L.; and Gardiner, J. Brooke, 4,138,370, Cl. 252-51.50A.
Segl, Walter E., Jr., 4,138,453, Cl. 264-22.000.
VanAuken, Richard; and Mills, Albert T., Jr., 4,138,301, Cl. 156-189.000.

Eygret, Daniel L.: *See—*
Martel, Bernard G. M.; Wallerand, Philippe G. S.; and Eygret, Daniel L., 4,137,871, Cl. 123-32.0EG.
Ezekiel, Aaron D.: *See—*
Steiger, Rolf; Reber, Jean-Francois; Ezekiel, Aaron D.; and Ficken, Geoffrey E., 4,138,551, Cl. 542-435.000.
F. W. McConnel Limited: *See—*
Brown, Leslie A.; and Norton, Harry W., 4,138,133, Cl. 280-405.00B.
Fagan, Thomas J.: *See—*
Sisk, Francis J.; and Fagan, Thomas J., 4,137,798, Cl. 74-812.000.
Fairchild Camera and Instrument Corporation: *See—*
Robinson, Barry J., 4,138,739, Cl. 365-174.000.
Fairfield Engineering Company, The: *See—*
Arms, Milo F.; and Ireland, James S., 4,138,333, Cl. 195-127.000.
Faisandier, Yves, to Societe CM Industries. Liquid flow control apparatus. 4,137,940, Cl. 137-486.000.
Fallon, John J., Jr.; and Cabeen, Robert P., III, to Fallon, John J., Jr.; and Ritt, Donald. Waste heat recovery system. 4,137,965, Cl. 165-1.000.
Faltin, Hans G. High speed insert handling mechanism and method. 4,138,101, Cl. 270-57.000.
Famolare, Inc.: *See—*
Famolare, Joseph P., Jr., 4,137,653, Cl. 36-3.00B.
Famolare, Joseph P., Jr., to Famolare, Inc. Footwear with snorkel ventilation. 4,137,653, Cl. 36-3.00B.
Fang, Hsai-Yang; and Mehta, Harshavardhan C. Sulfur-coated bamboo reinforcement member for concrete articles. 4,137,685, Cl. 52-727.000.
Fansteel Inc.: *See—*
Sheldon, Walter M., Jr., 4,138,113, Cl. 273-106.50C.
Fapiano, Donald J.; and Tablett, Edward E., to General Electric Company. Workpiece shape control. 4,137,741, Cl. 72-6.000.
Farber, Hans, to Gutehoffnungshutte Sterkrade Aktiengesellshaft. Metallurgical vessel. 4,138,097, Cl. 266-241.000.
Farber, Leland A., to Browning Arms Company. Composite breech plug for black powder guns. 4,137,663, Cl. 42-51.000.
Farin, Gunter; and Posselt, Gunther, to Erbe Elektromedizin KG. Electromedical clip structure. 4,137,919, Cl. 128-303.170.
Farmer, Cecil. Repair of armature commutator. 4,137,626, Cl. 29-597.000.
Farrand, Clair L., to Farrand Industries, Inc. Method for making a member of a position measuring transducer. 4,138,253, Cl. 96-27.00E.
Farrand Industries, Inc.: *See—*
Farrand, Clair L., 4,138,253, Cl. 96-27.00E.
Fatemi, Mohammad, to United States of America, Navy. Remotely operated, X-Y translation slide with stationary motors. 4,138,082, Cl. 248-419.000.
Faulkner, Dennis T.: *See—*
Glennon, Timothy F.; and Faulkner, Dennis T., 4,137,721, Cl. 60-711.000.
Faust, James H., to A B C Auto Alarms, Inc. Small siren having protective screen. 4,138,673, Cl. 340-405.000.
Fedders Corporation: *See—*
Martin, Robert L., 4,137,725, Cl. 62-160.000.
Feix, Kurt: *See—*
Langer, Konrad; and Feix, Kurt, 4,137,963, Cl. 164-448.000.
Felgen, Michael J.: *See—*
Stone, Thomas D.; Felgen, Michael J.; and de Man, Heiko T., 4,137,813, Cl. 84-314.000.
Felici, John D. Kitchen scoop and plunger. 4,137,578, Cl. 4-255.000.
Fenart, Jean-Claud, to Societe Anonyme Francaise du Ferodo. Speed change device. 4,137,786, Cl. 74-230.17E.
Ferstandig, Louis L., to Halocarbon Products Corporation. Fluorine substitution in 1,1,1-trihalomethanes. 4,138,355, Cl. 252-182.000.
Fiat-Allis Construction Machinery, Inc.: *See—*
Koch, George P., 4,137,944, Cl. 137-596.000.
Fiber Glass Systems, Inc.: *See—*
Michael, Vesta F., 4,138,285, Cl. 156-161.000.
Fiber Industries, Inc.: *See—*
Grayson, Allen M., Jr., 4,137,976, Cl. 177-1.000.
Ficken, Geoffrey E.: *See—*
Steiger, Rolf; Reber, Jean-Francois; Ezekiel, Aaron D.; and Ficken, Geoffrey E., 4,138,551, Cl. 542-435.000.
Fickenscher, Friedrich: *See—*
Niederste-Hollenberg, Heinz; Sacher, Christoph; Fickenscher, Friedrich; and Eichinger, Johann, 4,137,862, Cl. 115-41.0HT.
Fidry, Francois: *See—*
Arnal, Claude; and Fidry, Francois, 4,137,594, Cl. 15-198.000.
Fields, Ellis K.: *See—*
Puskas, Imre; and Fields, Ellis K., 4,138,392, Cl. 528-208.000.
Findlay, Peter M.: *See—*
Gostelow, Daniel W. F.; and Findlay, Peter M., 4,137,732, Cl. 66-140.00R.
Finke, Manfred: *See—*
Kleiner, Hans-Jerg; and Finke, Manfred, 4,138,433, Cl. 260-545.00P.
Firestone Tire & Rubber Company, The: *See—*
Gardner, James D.; and Lawrence, James P., 4,137,894, Cl. 152-330.0RF.
Firmenich & Cie: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,138,410, Cl. 260-332.20R.
Fischer, Georg: *See—*
Mattes, Lothar, 4,137,808, Cl. 83-851:000.
Fischer, Karl, to Strapex AG. Application for use with a strapping machine for displacing and tensioning a strapping band about an article or the like. 4,137,788, Cl. 74-242.900.
Fisher Controls Company: *See—*
Rice, Donald D.; and Walton, Herbert H., 4,137,934, Cl. 137-270.000.
Fisher, James R.: *See—*
Calvert, William L.; and Fisher, James R., 4,138,163, Cl. 302-52.000.
Fisons Limited: *See—*
Parsons, John H., 4,138,548, Cl. 542-421.000.
Flament, Ivon: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,138,410, Cl. 260-332.20R.
Fleissner, Hans, to Vepa AG. Apparatus for the heat treatment of textiles. 4,137,649, Cl. 34-158.000.
Fletcher, Ian J.: *See—*
Guglielmetti, Leonardo; Rochat, Alain C.; and Fletcher, Ian J., 4,138,429, Cl. 260-465.00H.
Fock, Jurgen; Schamberg, Eckehard; and Hoffmann, Wolfgang, to Th. Goldschmidt AG. Copolymerizate foil suitable for surface finishing. 4,138,450, Cl. 260-881.000.
Fong, William: *See—*
Broadway, Alexander R. W.; Fong, William; and Rawcliffe, Gordon H., 4,138,619, Cl. 310-184.000.
Fonte, Frank. Pole climbing apparatus. 4,137,995, Cl. 182-135.000.
Formax, Inc.: *See—*
Sandberg, Glenn A.; and Howe, George N., 4,137,604, Cl. 17-32.000.
Forschungs Institut fur Textiltechnologie: *See—*
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,138,298, Cl. 204-159.120.
Forster, Franz, to Linde AG. Hydrostatic transmission. 4,137,717, Cl. 60-487.000.
Fort, Jean F.; and Giraudon, Raymond, to Rhone-Poulenc S.A. Process for the preparation of oxadiazolines. 4,138,404, Cl. 260-307.00A.
Foster Wheeler Energy Corporation: *See—*
Steiner, Peter; and Bischoff, William F., 4,138,020, Cl. 214-17.00C.
Foxboro Company, The: *See—*
Handel, Neil E., 4,137,766, Cl. 73-194.0EM.
Frankel, Donald P.; Kendall, Willard E.; and Cooper, John F., to Lake Geneva A & C Corporation. Method of incinerating toilet wastes. 4,138,331, Cl. 210-63.00R.
Franklin, Burton P.: *See—*
Pickett, John E. P.; and Franklin, Burton P., 4,137,631, Cl. 30-337.000.
Franzmann, Rainer. Device for continuous pitch variation of stringed instruments. 4,137,812, Cl. 84-313.000.
Frech, Wolfgang, to Oskar Frech Werkzeugbau, Firma. Die casting machine with screw plugs in passages. 4,138,043, Cl. 222-596.000.
Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. Tetrahydro[1H]pyrazino[1,2-a]azaquinoxaline-5(6H)-ones and derivatives thereof. 4,138,564, Cl. 544-346.000.
Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. N-Carbobenzoxy-N'-(2-nitrophenyl)-2-piperazine carboxylic acid. 4,138,567, Cl. 544-388.000.
French, John B.; Reid, Neil M.; and Buckley, Janette A., to University of Toronto, The Governing Council of the. Method and apparatus for analyzing trace components using a gas curtain. 4,137,750, Cl. 73-23.000.
Freschard, Regis: *See—*
Degonde, Jean; Freschard, Regis; and de Poulepiquet, Louis, 4,137,908, Cl. 128-2.06R.
Fried. Krupp Huttenwerke AG: *See—*
Raquet, Erwin, 4,137,760, Cl. 73-146.000.
Fried, Walter I.: *See—*
Peyman, Gholam A.; Koziol, Jeffrey E.; Fried, Walter I.; and Sanders, Donald R., 4,138,191, Cl. 350-19.000.
Friedrich, Karl, to Textima AG. Metalworking press. 4,137,749, Cl. 72-449.000.
Frito-Lay, Inc.: *See—*
Smith, Jack R., 4,138,019, Cl. 211-87.000.
Fritz Buser Ag. Maschinenfabrik: *See—*
Voegelin, Heinrich, 4,137,841, Cl. 101-128.100.
Fromm, Hermann D.: *See—*
Hillenbrand, Engelbert; Fromm, Hermann D.; and Widmann, Alfred, 4,138,560, Cl. 544-203.000.
Fryd, Michael: *See—*
Chang, David C.; Fryd, Michael; and Krueger, Achim R., 4,138,381, Cl. 260-29.6TA.
Frye, Alva L.; and Stewart, Herbert M., to Aladdin Industries, Incorporated. Vacuum bottle construction. 4,138,027, Cl. 215-13.00R.
Fuchs, Hugo: *See—*
Neubauer, Gerald; Van Wauwe, Gerard; Beullens, Josef; Brand, Uwe; Fuchs, Hugo; and Kartte, Klaus, 4,138,472, Cl. 423-549.000.
Fuhring, Heinrich, to Bowe Bohler & Weber KG. Drum-type drier for fabric. 4,137,646, Cl. 34-75.000.
Fuji Electric Co., Ltd.: *See—*
Matsushita, Shigetada, 4,137,765, Cl. 73-194.0EM.
Fuji Photo Film Co., Ltd.: *See—*
Adachi, Keiichi; Shisido, Tadao; Hara, Hiroshi; and Hirano, Shigeo, 4,138,259, Cl. 96-74.000.
Hinata, Masanao; Mihara, Yuji; Shishido, Tadao; and Adachi, Keiichi, 4,138,266, Cl. 96-123.000.

Hirose, Takeshi; Shiba, Keisuke; Yokota, Yukio; Inouye, Kozo; and Okumura, Akio, 4,138,258, Cl. 96-74.000.
Igarashi, Akira, 4,138,357, Cl. 252-188.30R.
Ishizuka, Akio; and Miyamoto, Akio, 4,138,522, Cl. 428-195.000.
Tadokoro, Eiichi; Utumi, Masahiro; Fujiyama, Masaaki; and Takayama, Satoru, 4,138,229, Cl. 51-398.000.

Fujikawa, Kanichi: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Nagatani, Kuniaki; and Nishimura, Shigeyuki, 4,138,436, Cl. 260-581.000.

Fujita, Saburo: *See*—
Motegi, Masahiko; Fujita, Saburo; Okabe, Kazuo; Miura, Yasuki; and Minami, Satoyuki, 4,138,386, Cl. 260-40.00R.

Fujitsu Limited: *See*—
Endoh, Takeshi; and Takayasu, Mitsuru, 4,138,059, Cl. 235-483.000.
Iizuka, Yoshio, 4,138,693, Cl. 358-288.000.
Kamimoto, Shigemi; Hayashi, Toshio; and Shimizu, Kazuyuki, 4,138,731, Cl. 364-783.000.
Shimoyama, Atsushi, 4,138,662, Cl. 340-146.3MA.
Unotoro, Tomoyuki; Ueda, Yoichi; Shirouchi, Yasunari; Yamashita, Hideo; Sato, Sei; and Murase, Kenji, 4,138,626, Cl. 315-169.400.

Fujiwara, Kenji: *See*—
Sakakibara, Shumpei; Nagai, Yutaka; Fujiwara, Kenji; and Sakai, Takahiro, 4,138,394, Cl. 260-112.50R.

Fujiyama, Masaaki: *See*—
Tadokoro, Eiichi; Utumi, Masahiro; Fujiyama, Masaaki; and Takayama, Satoru, 4,138,229, Cl. 51-398.000.

Fukui, Shiomi: *See*—
Arai, Kozo; Fukui, Shiomi; Nagata, Masaki; and Kotani, Teizo, 4,138,369, Cl. 252-512.000.

Fukuoka, Suguru: *See*—
Nagatugi, Shuzo; Miyagawa, Akira; and Fukuoka, Suguru, 4,138,225, Cl. 44-42.000.

Fulger, Charles V.; and Dewey, James E., to Kellogg Company. Acid soluble acylated protein and method. 4,138,500, Cl. 426-46.000.

Fullington, Michael C.; and Hirdler, Louis C., to Olin Corporation. Recovery of chlorine and cyanuric acid values from polychloroisocyanuric acids and salts thereof. 4,138,559, Cl. 544-192.000.

Furuya, Noboru: *See*—
Amano, Kenichi; and Furuya, Noboru, 4,138,638, Cl. 324-29.000.

Fushiki, Isamu; Koboshi, Sigeharu; and Terada, Sadatugu, to Konishiroku Photo Industry Co., Ltd. Process for the treatment of photographic materials. 4,138,257, Cl. 96-60.0BF.

Fuxe, Kjell, to Nelson Research & Development Company. Method for treating schizophrenia and method and composition for potentiating neuroleptic drugs. 4,138,484, Cl. 424-247.000.

G. D. Searle & Co.: *See*—
Krimmel, Carl P., 4,138,566, Cl. 544-357.000.

G&H Technology, Inc.: *See*—
Soos, William B., 4,138,183, Cl. 339-94.00M.

Gaerber, Wolfgang: *See*—
Sander, Bruno; Bonitz, Eckhard; Voss, Heinz; and Gaerber, Wolfgang, 4,138,315, Cl. 162-146.000.

GAF Corporation: *See*—
Barabas, Eugene S.; and Klein, Andrew, 4,138,380, Cl. 260-29.60Z.
Tracy, David J.; and Hoffstadt, Walter F., 4,138,571, Cl. 560-22.000.
Verdiccio, Robert J.; and Nehmsmann, Louis J., 4,138,371, Cl. 252-545.000.

Gaffar, Maria Corazon S., to Colgate Palmolive Company. Composition to control mouth odor. 4,138,477, Cl. 424-52.000.

Gailis, Gunar E.: *See*—
Buls, Yanis I.; Gailis, Gunar E.; Borovikova, Sofia M.; Lurie, Evgeny V.; and Mikhailov, Valery F., 4,138,065, Cl. 241-55.000.

Gallivan, Timothy J., to General Electric Company. Fugitive binder for nuclear fuel materials. 4,138,360, Cl. 252-301.10R.

Gandilhon, Pierre, to Rhone-Poulenc S. A. Process for the isomerization of aromatic alkenyl compounds. 4,138,411, Cl. 260-340.50R.

Gankevich, Tamara T.: *See*—
Vereschagin, Leonid F.; Semerchian, Aik A.; Gankevich, Tamara T.; Dmitriev, Mikhail E.; and Modenov, Vitaly P., 4,138,252, Cl. 75-244.000.

Gans, Ernest. Magnetic square and jig saw puzzle. 4,138,115, Cl. 273-153.00R.

Gantley, Francis C., to General Electric Company. Wafer sawing technique. 4,138,304, Cl. 156-268.000.

Gardiner, J. Brooke: *See*—
Elliott, Robert L.; and Gardiner, J. Brooke, 4,138,370, Cl. 252-51.50A.

Gardner, James D.; and Lawrence, James P., to Firestone Tire & Rubber Company, The. Pneumatic tire, rim and run-flat system combination. 4,137,894, Cl. 152-330.0RF.

Gardner, Jeffrey M., to Container Corporation of America. Bulk container with handling flange. 4,138,053, Cl. 229-23.00R.

Gardner, Michael C. Article of ornamented clothing and method of ornamenting the same. 4,138,517, Cl. 428-88.000.

Garrett, Michael E., to Boc Limited. Liquid treatment. 4,138,330, Cl. 210-63.00R.

Gartner, Karl-Heinz, to Hilti Aktiengesellschaft. Expansion dowel with a setting control. 4,137,816, Cl. 85-61.000.

Gautschi, Fritz: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,138,410, Cl. 260-332.20R.

Gay, Walter A., to Olin Corporation. Process for producing pentachloronitrobenzene. 4,138,438, Cl. 260-646.000.

Gebruder Heller Machinenfabrik GmbH: *See*—
Bauml, Kurt; Gunsser, Otto C.; and Lohse, Rudolf K., 4,137,823, Cl. 90-64.000.

Geller, Harold H.: *See*—
Strauss, Karl M.; Geller, Harold H.; and Wagner, Bernd J., 4,138,499, Cl. 426-16.000.

Gelnett, Leland E.: *See*—
Kruse, John M.; and Gelnett, Leland E., 4,138,087, Cl. 251-5.000.

Gendron, George J.; and Phares, Lindsey J., to Raymond International, Inc. Method of driving piles underwater. 4,138,199, Cl. 405-232.000.

General Cable Corporation: *See*—
Olszewski, Jerzy A.; and Sarkar, Arnab, 4,138,193, Cl. 350-96.230.

General Electric Company: *See*—
Andersen, Richard H.; Corsmeier, Robert J.; Rauf, James P.; and Lenahan, Dean T., 4,137,705, Cl. 60-39.080.
Beltran, Adrian M.; Muth, Myron C.; and Schilling, William F., 4,137,619, Cl. 29-156.80H.
Bluestein, Ben A., 4,138,387, Cl. 260-42.260.
Brown, Edgar D., Jr., 4,138,349, Cl. 252-49.900.
Brown, Richard N., 4,138,606, Cl. 219-442.000.
Crivello, James V., 4,138,255, Cl. 96-35.100.
Downing, Robert D.; and Sobieski, John C., 4,138,621, Cl. 313-113.000.
Eichelberger, Charles W.; and Butler, Walter J., 4,138,665, Cl. 340-347.0NT.
Eichelberger, Charles W.; and Butler, Walter J., 4,138,666, Cl. 340-347.0CC.
Fapiano, Donald J.; and Tablett, Edward E., 4,137,741, Cl. 72-6.000.
Gallivan, Timothy J., 4,138,360, Cl. 252-301.10R.
Gantley, Francis C., 4,138,304, Cl. 156-268.000.
Linko, Peter J., III; and Harrier, Stanley C., 4,137,949, Cl. 138-125.000.
McMillan, John E., 4,138,623, Cl. 313-331.000.
Nedreski, Robert J., 4,137,677, Cl. 51-165.770.
Russillo, Joseph G.; and Earl, William C., 4,138,697, Cl. 360-6.000.
Scott, Steven W.; and Vaughn, Howard A., Jr., 4,138,379, Cl. 260-29.10R.
Wanger, Robert P., 4,137,707, Cl. 60-39.28R.
Wolfinger, John F., 4,137,780, Cl. 73-650.000.

General Foods Corporation: *See*—
Ehrgott, Charles W.; and Edwards, David C., 4,138,502, Cl. 426-385.000.

General Motors Corporation: *See*—
Aspinwall, Robert H.; and Baker, Charles R., 4,137,708, Cl. 60-204.000.
Bright, James A.; and Deaton, Homer W., 4,137,735, Cl. 68-18.00D.
Brown, Trevor J., 4,138,198, Cl. 403-247.000.
Cataldo, Roy S., 4,137,960, Cl. 152-158.000.
Graham, Donald E., 4,138,630, Cl. 318-257.000.
Halterman, Francis J., Jr., 4,137,981, Cl. 180-9.500.
Johnson, Lauren L.; and Wilson, Robert J., 4,138,706, Cl. 361-42.000.
Malloy, John D., 4,138,003, Cl. 192-3.290.
Nehmer, Carl A.; and Sweet, Douglas W., 4,138,723, Cl. 364-424.000.
Osborne, Turner E., 4,137,847, Cl. 102-39.000.
Pol, Kenneth J., 4,137,962, Cl. 164-236.000.
Rehfeld, Frederick L. J., 4,137,989, Cl. 180-148.000.
Strong, Steven L., 4,138,009, Cl. 198-396.000.
Thornburgh, William F., 4,137,882, Cl. 123-136.000.
Van Ostrom, David L., 4,137,885, Cl. 123-179.00H.
Winchell, Frank J., 4,137,985, Cl. 180-114.000.
Wize, Gary A., 4,138,142, Cl. 280-745.000.
Zaydel, Wieslaw S., 4,137,959, Cl. 151-27.000.

General Signal Corporation: *See*—
Andersen, George L., 4,138,141, Cl. 280-689.000.

General Time Corporation: *See*—
Kepchar, Michael W., 4,138,672, Cl. 340-378.100.

George, Peter K.; and Kobayashi, Tsutomu, to Rockwell International Corporation. One level switch for magnetic bubble domain devices. 4,138,736, Cl. 365-12.000.

Georgi, Heinz W., to IVAC Corporation. Fluid flow control system. 4,137,913, Cl. 128-214.00F.

Georgia-Pacific Corporation: *See*—
DeLuca, Raymond F.; and Jespersen, Paul W., 4,137,805, Cl. 83-345.000.

Gerber Garment Technology, Inc.: *See*—
Gerber, Heinz J.; and Pearl, David R., 4,137,804, Cl. 83-177.000.

Gerber, Heinz J.; and Pearl, David R., to Gerber Garment Technology, Inc. Fluid cutting jet receiver. 4,137,804, Cl. 83-177.000.

Gieck, Joseph F. Process for recovering sulfur from sour gas. 4,138,473, Cl. 423-574.00R.

Gilardini S.p.A.: *See*—
Nigra, Antonio, 4,137,889, Cl. 123-198.0DB.

Gildengorn, Melis S.: *See*—
Muratov, Rustem I.; Kot, Jury D.; Belov, Mikhail F.; Gildengorn, Melis S.; Konkov, Vyacheslav S.; and Erlikh, Mikhail I., 4,137,745, Cl. 72-263.000.

Gill, Ronald A.; Wojtowicz, Waldemar S.; Berthold, Cornelius E.; and Wheeler, Cecil M., to Sappi Limited. Process of recovering sodium carbonate from spent pulping liquors. 4,138,312, Cl. 162-30.00R.

Gilliams, Yvan K.; De Volder, Noel J.; Pollet, Robert J.; Tavernier, Bernard H.; De Jaeger, Nikolaas C.; and Sels, Francis J., to AGFA-GEVAERT N.V. Electrophoretic liquid developer containing a metal alkyl sulphonate. 4,138,351, Cl. 252-62.10L.

Giraudon, Raymond: *See—*
Fort, Jean F.; and Giraudon, Raymond, 4,138,404, Cl. 260-307.00A.

Girault, Herve; and Colas, Daniel, to Thomson-CSF. Airborne arrangement for displaying a moving map. 4,138,726, Cl. 364-521.000.

Gitlitz, Melvin H.; Engelhart, John E.; and Mery, Carlos M., to M&T Chemicals Inc. Insecticidal compositions containing certain tetraorganotin compounds and method for using same. 4,138,483, Cl. 424-245.000.

Givner, Morris L., to American Home Products Corporation. Diagnostic test utilizing human chorionic gonadotropin. 4,138,214, Cl. 23-230.00B.

Glaski, Fred A., to United States of America, Army. Process for chemical vapor deposition of a homogeneous alloy of refractory metals. 4,138,512, Cl. 427-237.000.

Glaxo Laboratories, Limited: *See—*
Cook, Martin C.; Gregory, Gordon I.; and Bradshaw, Janice, 4,138,555, Cl. 544-22.000.

Glennon, Timothy F.; and Faulkner, Dennis T., to Sundstrand Corporation. Control system for plural engines. 4,137,721, Cl. 60-711.000.

Glory Kogyo Kabushiki Kaisha: *See—*
Matono, Hirokuni, 4,137,927, Cl. 133-1.00A.

Godard, Dominique N.; and Milewski, Andrzej T., to International Business Machines Corporation. Adaptive phase detection method and apparatus. 4,138,644, Cl. 325-320.000.

Goddard, Steven J., to Du Pont de Nemours, E. I., and Company. Novel 2-aryl-2,3,5,6,7,8-hexahydro-3-thioxoimidazo-[1,5-a-]pyridin-1(BaH)-ones as herbicides. 4,138,242, Cl. 71-92.000.

Goddard, Terrence P.; and Thatcher, Donald N., to Teledyne McCormick Selph. High burning rate propellants with coprecipitated salts of decahydrodecaboric acid. 4,138,282, Cl. 149-19.800.

Goebel, Peter H.: *See—*
Beck, Robert L.; and Goebel, Peter H., 4,138,643, Cl. 324-158.00F.

Golby Bag Company, Inc.: *See—*
Golby, Jerome L.; and Goodin, Steven, 4,137,958, Cl. 150-1.000.

Golby, Jerome L.; and Goodin, Steven, to Golby Bag Company, Inc. Polypropylene bag for use in an automatic filling process. 4,137,958, Cl. 150-1.000.

Golden, Ronald: *See—*
Vincent, David N.; and Golden, Ronald, 4,138,356, Cl. 252-182.000.

Goldinger, John A., to PPG Industries, Inc. Scoring device having a referencing carriage. 4,137,803, Cl. 83-881.000.

Goldman, Stephen B.: *See—*
Hirsbrunner, Hans G.; and Goldman, Stephen B., 4,138,251, Cl. 75-234.000.

Gollasch, Bernd: *See—*
Scholz, Manfred; and Gollasch, Bernd, 4,138,321, Cl. 176-87.000.

Gongwer, Calvin A., to Innerspace Corporation. Turbomachinery and method of operation. 4,137,709, Cl. 60-204.000.

Gonin, Andre, to Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement. Discharge valves. 4,137,941, Cl. 137-508.000.

Goodin, Steven: *See—*
Golby, Jerome L.; and Goodin, Steven, 4,137,958, Cl. 150-1.000.

Goodman, Ronald K.; and Hunt, Angus L., to United States of America, Energy. Method for forming electrically charged laser targets. 4,138,609, Cl. 250-396.00R.

Goossens, Alfred E.: *See—*
Mookherjee, Braja D.; Evers, William J.; and Goossens, Alfred E., 4,138,413, Cl. 260-347.200.

Goplen, Arne: *See—*
Thompson, Lowell H.; and Goplen, Arne, 4,137,693, Cl. 56-8.000.

Goralski, Edwin A., to Minnesota Mining and Manufacturing Company. Hand file board with a central handle. 4,137,670, Cl. 51-392.000.

Gordon, David A.: *See—*
Hall, Luther A. R.; and Gordon, David A., 4,138,569, Cl. 548-309.000.

Gordon, Ronald S.: *See—*
Shaikh, Mohammed N.; Cutler, Ivan B.; Virkar, Anil V.; and Gordon, Ronald S., 4,138,455, Cl. 264-56.000.

Gorin, Everett, to Continental Oil Company. Manufacture of pellets from coal conversion products. 4,138,221, Cl. 44-10.00C.

Gorin, Everett, to Continental Oil Company. Pelletization of coal conversion products. 4,138,222, Cl. 44-10.00C.

Gorin, Everett, to Continental Oil Company. Manufacture of pellets from coal liquefaction products. 4,138,223, Cl. 44-10.00C.

Gorin, Everett, to Continental Oil Company. Production of fixed bed gasifier feedstock and fuels from coal. 4,138,224, Cl. 44-23.000.

Gosalvez, Mario G. Novel anthracycline glycosides and methods of preparing the same. 4,138,480, Cl. 424-180.000.

Gosteli, Jacques, to Ciba-Geigy Corporation. Phosphono-isocyano-acetates. 4,138,451, Cl. 260-940.000.

Gostelow, Daniel W. F.; and Findlay, Peter M., to Wildt Mellor Bromley Limited. Yarn feed and yarn change mechanism. 4,137,732, Cl. 66-140.00R.

Gould, Arnold S.: *See—*
Brazinsky, Irving; Cooper, William M.; and Gould, Arnold S., 4,138,459, Cl. 264-154.000.

Graden, Lester E. Furnace air circulation system. 4,138,062, Cl. 237-55.000.

Graf, Ronald E. Electrostatic neutral ink printer. 4,138,686, Cl. 346-75.000.

Grafinger, Wilhelm: *See—*
Becker, Friedbert; Grafinger, Wilhelm; and Hildebrandt, Bernhard, 4,138,676, Cl. 343-6.50R.

Graham, Donald E., to General Motors Corporation. Electric motor reversing control system. 4,138,630, Cl. 318-257.000.

Grain Systems, Inc.: *See—*
Trumper, Mark A., 4,137,682, Cl. 52-303.000.

Granges Oxelosunds Jarnverk AB: *See—*
Karlsson, Per-Olle, 4,138,277, Cl. 148-9.500.

Grantz, Alan L., to United States of America, Energy. Fluidic self-actuating control assembly. 4,138,320, Cl. 176-86.00R.

Grasshoff, Hans D., to Deutsche Texaco Aktiengesellschaft. Lubricant for use in non-chip metal forming. 4,138,348, Cl. 252-42.100.

Gray, William E., to Caterpillar Tractor Co. Sectionalized panel closure. 4,137,983, Cl. 180-69.00R.

Grayson, Allen M., Jr., to Fiber Industries, Inc. Method and apparatus for bale weight control. 4,137,976, Cl. 177-1.000.

Greene, Samuel. Swimming pool. 4,137,576, Cl. 4-172.190.

Greenwood, Mark E., to Owens-Corning Fiberglas Corporation. Noncorrosive lifting lug for tanks. 4,138,031, Cl. 220-71.000.

Gregorius, Klaus: *See—*
Janner, Karl; Gregorius, Klaus; and Stehle, Heinz, 4,138,297, Cl. 204-157.10R.

Gregory, Gordon I.: *See—*
Cook, Martin C.; Gregory, Gordon I.; and Bradshaw, Janice, 4,138,555, Cl. 544-22.000.

Griffin, James A., to Industrial Device Corporation. Electromechanical equivalent of fluid powered cylinder. 4,137,784, Cl. 74-89.150.

Grigsby, Carroll M.: *See—*
Boutell, Richard G.; and Grigsby, Carroll M., 4,137,824, Cl. 91-1.000.

Grimm, Maurice: *See—*
Saurer, Eric; and Grimm, Maurice, 4,138,195, Cl. 350-345.000.

Grogan, Richard P., to Diamond International Corporation. Dispensing pump housing and operating lever assembly. 4,138,038, Cl. 222-207.000.

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Gross, Thomas A. O. Ground fault protective systems with predetection neutralization of reactive currents. 4,138,707, Cl. 361-45.000.

Grossman, Peter J. Fingernail cleaner. 4,137,929, Cl. 134-182.000.

Grossmann, Peter K. Snow ski brake. 4,138,138, Cl. 280-605.000.

Grumman Aerospace Corporation: *See—*
Chen, Schoen-nan, 4,138,532, Cl. 429-111.000.

GTE Automatic Electric Laboratories, Inc.: *See—*
Daebler, Donald H.; and Morgan, John H., 4,138,018, Cl. 209-633.000.

Guenther, Lloyd M., to Chevron Research Company. Heat wand for splicing twisted thermoplastic tapes. 4,138,308, Cl. 156-433.000.

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Kaminsky, Victor; Trevoy, Lloyd W.; and Maskwa, Alvin, 4,138,467, Cl. 423-74.000.

Gulf Research & Development: *See—*
Swift, Harold E.; and Vogel, Roger F., 4,138,326, Cl. 208-108.000.

Gulf Research & Development Company: *See—*
Bacha, John D.; and Selwitz, Charles M., 4,138,412, Cl. 260-346.300.
Beuther, Harold; McKinney, Joel D.; and Swift, Harold E., 4,138,325, Cl. 208-50.000.

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Bauml, Kurt; Gunsser, Otto C.; and Lohse, Rudolf K., 4,137,823, Cl. 90-64.000.

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Farber, Hans, 4,138,097, Cl. 266-241.000.

Haberey, Florian. Method of permanently bonding magnetic ceramics. 4,138,236, Cl. 65-43.000.

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Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, 4,138,593, Cl. 179-1.00E.

Hacker, John R.; Krohne, Chris W.; and Miller, William H., to United States of America, Navy. Releasable electrical connector. 4,138,181, Cl. 339-45.00R.

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Hahn, Walter: *See—*
Stolz, Robert; and Hahn, Walter, 4,138,169, Cl. 308-189.00R.

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Utz, Kastulus; Esterhammer, Josef; and Hakl, Heinz, 4,137,688, Cl. 53-432.000.

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Hall, Thomas E. Article carrying and unloading device. 4,138,159, Cl. 298-18.000.

Hallock, James N.; Spitzer, Edward A.; and Wood, William D., to United States of America, Transportation. Vortex advisory system. 4,137,764, Cl. 73-178.00T.

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Ferstandig, Louis L., 4,138,355, Cl. 252-182.000.

Halterman, Francis J., Jr., to General Motors Corporation. Pivot shaft roller frame support. 4,137,981, Cl. 180-9.500.

Halvarsson, Harald, to Stal-Laval Turbin AB. Tool for control measurement of gears. 4,137,642, Cl. 33-179.50D.

Hamilton, Douglas J.: *See—*
McCormick, J. Byron; Depp, Steven W.; Hamilton, Douglas J.; and Kerwin, William J., 4,138,622, Cl. 313-306.000.

Hamilton & Spiegel, Inc.: *See*—
Spiegel, Samuel, 4,138,083, Cl. 248-474.000.
Hamlin, Percy J.: *See*—
Teot, Arthur S.; Hamlin, Percy J.; and Savage, Albert B., 4,138,352, Cl. 252-135.000.
Hammond, James W.: *See*—
Davis, Newton G.; Hammond, James W.; and Loomis, Phillip E., 4,137,624, Cl. 29-566.100.
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Handel, Neil E., to Foxboro Company, The. Integral field magnetic flowmeter. 4,137,766, Cl. 73-194.0EM.
Haney, Jerry D.: *See*—
Jansen, William D.; Haney, Jerry D.; Day, Christopher C.; and Schneeberger, Stephen A., 4,137,907, Cl. 128-2.05M.
Hansen, Robert S. Hanging card storage system. 4,138,172, Cl. 312-184.000.
Hanusa, Helmut G., to Textron Inc. Process for producing fabric-backed cushioning material. 4,138,283, Cl. 156-77.000.
Hara, Eisuke: *See*—
Ohira, Toshiaki; Hara, Eisuke; and Takagi, Yasuo, 4,138,271, Cl. 127-34.000.
Hara, Hiroshi: *See*—
Adachi, Keiichi; Shisido, Tadao; Hara, Hiroshi; and Hirano, Shigeo, 4,138,259, Cl. 96-74.000.
Hardcastle, Philip P., to Equipment Renewal Company. Pressure vessel nut and lock screw arrangement. 4,137,946, Cl. 138-103.000.
Harder, Niels U.: *See*—
Borresen, Thor; and Harder, Niels U., 4,138,526, Cl. 428-419.000.
Hargraves, Melvin J.; and Peters, Clifford M., to W-K-M Wellhead Systems, Inc. Control valve having integral visual indicator for fluid safety systems. 4,137,942, Cl. 137-557.000.
Hari, Stefan; Rinaldi, Ernesto; and Somio, Josef, to Ciba-Geigy Corporation. Process for the manufacture of benzimidazolones-(2). 4,138,568, Cl. 548-305.000.
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Austin, George A., 4,137,800, Cl. 81-57.390.
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Harmsen, Nils; Markhof, Horst; Reichelt, Walter; Schiff, Klaus-Ludwig; and Thiede, Horst, to W. C. Heraeus GmbH. Electrical plug-type connector. 4,138,604, Cl. 200-267.000.
Harrier, Stanley C.: *See*—
Linko, Peter J., III; and Harrier, Stanley C., 4,137,949, Cl. 138-125.000.
Harris Corporation: *See*—
Luhowy, Gabriel J., 4,138,654, Cl. 334-55.000.
Harrison, Howard M. Periodical holder. 4,138,055, Cl. 232-1.00C.
Hart, James R.; and Brown, Patrick D., to Blue Wing Corporation. Nutrient compositions derived from animal blood solids and process for producing same. 4,138,505, Cl. 426-573.000.
Hartfelt, Jorgen; and Hoehn, Ralf, to Hoehn, Ralf. Abrasive of a microporous polymer matrix with inorganic particles thereon. 4,138,228, Cl. 51-295.000.
Hartmann, Volker: *See*—
Ehrhardt, Lothar; Patt, Ludwig; and Hartmann, Volker, 4,138,565, Cl. 544-346.000.
Hartup, Frederick W., to Bel Air Mart. Checkout counter. 4,138,000, Cl. 186-1.00A.
Harvey, Douglas P. Standard parallel rule with perspective drawing device. 4,137,635, Cl. 33-77.000.
Harvey Hubbell, Incorporated: *See*—
Brygger, Flemming, 4,138,187, Cl. 339-117.00R.
Jaconette, Frank C., Jr., 4,138,185, Cl. 339-107.000.
Hasegawa, Yoshihisa: *See*—
Ueda, Shigeru; Makino, Kazuo; Nakata, Yoshinori; Hasegawa, Yoshihisa; Yokoyama, Shinichi; Yoshida, Ryoichi; Maekawa, Yousuke; and Yoshida, Yuji, 4,138,035, Cl. 222-1.000.
Hasenbeck, Harold W. Conduction type soil matric potential sensor. 4,137,931, Cl. 137-78.000.
Hasler AG: *See*—
Vogel, Paul, 4,138,667, Cl. 340-347.0DA.
Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, to Braun AG. Moving voice coil loudspeaker with heat dissipating enclosure. 4,138,593, Cl. 179-1.00E.
Hauck, Frederic P.; Sundeen, Joseph E.; and Reid, Joyce, to E. R. Squibb & Sons, Inc. Indanpentol derivative for treating hypertension. 4,138,497, Cl. 424-305.000.
Haugwitz, Rudiger D.; Cruthers, Larry R.; and Maurer, Barbara V., to E. R. Squibb & Sons, Inc. 2,2-Dihalo-1(3)-lower alkyl-cyclopropylalkylthio benzimidazole derivatives, compositions thereof and method of use in treating tapeworms and whipworms. 4,138,493, Cl. 424-273.00B.
Haverl, Ronald A.; and Stoller, Milton, to Mediscan Inc. Ultrasonic body scanner and method. 4,137,777, Cl. 73-620.000.
Hayashi, Kunio: *See*—
Noro, Shuhei; Hayashi, Kunio; and Wada, Yoshisada, 4,137,674, Cl. 51-281.00R.
Hayashi, Takao: *See*—
Ukihashi, Hiroshi; Hayashi, Takao; and Takasaki, Yukio, 4,138,417, Cl. 260-406.000.
Hayashi, Toshio: *See*—
Kamimoto, Shigemi; Hayashi, Toshio; and Shimizu, Kazuyuki, 4,138,731, Cl. 364-783.000.
Hayes, Francis G., to Clarendon Press Pty. Limited. Teaching aid. 4,137,650, Cl. 35-8.00R.
Hch. Bertrams Aktiengesellschaft: *See*—
Kuhnlein, Hans L.; and Muller, Wolfgang-Dieter, 4,138,309, Cl. 159-13.00A.
Heanley, Charles P.; Tylko, Jozef K.; and Page, David G. S. Apparatus for preparation of blood samples. 4,137,866, Cl. 118-106.000.
Heard, Roderick S.; Hill, James D.; and Phillips, David W., to International Business Machines Corporation. Method and apparatus for automatically controlling the inclination of patterns in ink jet printers. 4,138,688, Cl. 346-75.000.
Heckel, Klaus: *See*—
Klaffke, Friedemann; and Heckel, Klaus, 4,137,575, Cl. 4-172.120.
Heckeroth, Earl T., to Dow Chemical Company, The. Die face cutter. 4,138,208, Cl. 425-71.000.
Hedenas, Bo G. V.; Wiklund, Johan E.; Johansson, Thore R. H.; and Melkersson, Karl-Axel, to Boliden Aktiebolag. Method of wet-cleaning gases containing sulfur dioxide, halogens and arsenic from pyrometallurgical treatment of sulphidic materials. 4,138,231, Cl. 55-71.000.
Hedlund, Lee V.; and Luther, Arch C., to RCA Corporation. Disc eccentricity compensating system. 4,138,741, Cl. 365-234.000.
Heger, Adolf: *See*—
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Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
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Heimberger, Helmut, to Optilon W. Erich Heilmann GmbH. Slide-fastener-stringer half with knitted-in coupling elements and method of making same. 4,137,733, Cl. 66-195.000.
Hein, Wolfgang: *See*—
Cosack, Claus; Hein, Wolfgang; Hese, Nils; Neumann, Manfred; and Willemer, Wilhelm, 4,137,756, Cl. 73-64.300.
Hellbach, Hans: *See*—
Baur, Karl G.; Hellbach, Hans; Platz, Rolf; and Taglieber, Kurt, 4,138,591, Cl. 568-756.000.
Heller, Georg: *See*—
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Helling, Gunter: *See*—
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Hendrickson, Richard L. Kicker apparatus for table game. 4,138,110, Cl. 273-85.00D.
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Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity: *See*—
Kaminsky, Victor; Trevoy, Lloyd W.; and Maskwa, Alvin, 4,138,467, Cl. 423-74.000.
Herbstman, Sheldon; Cole, Edward L.; and Estes, John H., to Texaco Inc. Self-alkylation of isobutane. 4,138,444, Cl. 260-683.470.
Herbstman, Sheldon: *See*—
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Heremans, Marie-Therese Bracke, legal representative: *See*—
Masson, Pierre L.; and Heremans, Joseph, deceased, 4,138,213, Cl. 23-230.00B.
Herleth, Karl, to Magnetronic Gesellschaft fur elektronischmechanische Gerate mbH & Co., Entwicklungs-KG. Drive assembly for a magnetic-tape device. 4,137,789, Cl. 74-404.000.
Herlitzek, Werner, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Axial securing assembly for roller or ball bearings. 4,138,168, Cl. 308-189.00R.
Herman, Gerald T., to Boeing Company, The; and Aeritalia S.p.A. Turbojet engine nozzle for attenuating core and turbine noise. 4,137,992, Cl. 181-213.000.
Herriau, Jean-Pierre: *See*—
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Hertz, Martin R.: *See*—
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Hertzenberg, Elliot P.; and Sherry, Howard S., to PQ Corporation. Silane-zeolite compositions. 4,138,363, Cl. 252-430.000.
Herubel, Jean F., to N. Schlumberger & Cie. Device for facilitating the doffing of full bobbins on fly-frames. 4,137,701, Cl. 57-267.000.
Hese, Nils: *See*—
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Hetkamp, Gunter: *See*—
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Hewitt, Delbert C. Double acting fluid operated piston cylinder assembly. 4,137,827, Cl. 92-24.000.
Hewitt, Johnnie D. Boat trailer. 4,138,135, Cl. 280-414.00R.
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Hill, James D.: *See*—
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Hill, Robert D., to United States of America, Navy. Automated flash-bang method and apparatus for determining lightning stroke distances. 4,138,660, Cl. 340-16.00R.
Hillenbrand, Engelbert; Fromm, Hermann D.; and Widmann, Alfred, to BASF Aktiengesellschaft. Process for cooling melamine synthesis waste gases. 4,138,560, Cl. 544-203.000.
Hillstrom, Per A. R.; and Norehall, Lars G., to Mo och Domsjo Aktiebolag. Method and apparatus for continuously washing fibrous suspensions and controlling the volume of wash liquid. 4,138,313, Cl. 162-49.000.
Hilti Aktiengesellschaft: *See*—
Gartner, Karl-Heinz, 4,137,816, Cl. 85-61.000.
Hinata, Masanao; Mihara, Yuji; Shishido, Tadao; and Adachi, Keiichi, to Fuji Photo Film Co., Ltd. Method for spectrally sensitizing photographic light-sensitive emulsions. 4,138,266, Cl. 96-123.000.
Hirai, Keitaro: *See*—
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Hiraiwa, Kazuyoshi, to Nissan Motor Company, Limited. Gear shifting device. 4,137,790, Cl. 74-473.00R.
Hiramatsu, Iwao, to Nissan Diesel Motor Company, Ltd. Air intake system for an internal combustion engine. 4,137,886, Cl. 123-188.0AF.
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Hirose, Takeshi; Shiba, Keisuke; Yokota, Yukio; Inouye, Kozo; and Okumura, Akio, to Fuji Photo Film Co., Ltd. Multi-layered color photographic materials. 4,138,258, Cl. 96-74.000.
Hirsbrunner, Hans G.; and Goldman, Stephen B., to Texas Instruments Incorporated. Electrical contact material. 4,138,251, Cl. 75-234.000.
Hirschle, Georg, to SGX Sulzer-General Atomic Warmetauscher Aktiengesellschaft. Steam generator. 4,137,967, Cl. 165-162.000.
Hisaoka, Satoshi: *See*—
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Hiscoe, Ernest C., to Nashua Corporation. Apparatus and method for stacking rolls of pressure sensitive tape. 4,138,024, Cl. 214-152.000.
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Nishikawa, Akio; Yokono, Hitoshi; Simizu, Ryuichi; and Mukai, Junji, 4,138,372, Cl. 528-45.000.
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Tanifuji, Shinya; and Morooka, Yasuo, 4,137,742, Cl. 72-6.000.
Hitch, Robert K. Automated means for high volume, discrete depth plankton collecting. 4,137,772, Cl. 73-421.00R.
Hix, Ernet T., to NDM Corporation. Medical electrode. 4,137,909, Cl. 128-2.06E.
Hlavac, Harry F., to Sports Safety, Inc. Footwear device. 4,137,654, Cl. 36-119.000.
Hoechst Aktiengesellschaft: *See*—
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Kleiner, Hans-Jerg; and Finke, Manfred, 4,138,433, Cl. 260-545.00P.
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Strauss, Julius; Hubner, Herbert; Muller, Heinz; and Krempl, Engelbert, 4,138,437, Cl. 260-583.00R.
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Hofmann, Heinrich: *See*—
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Holland, Gerald F., to Pfizer Inc. Sulfamylbenzoic acid. 4,138,399, Cl. 260-239.800.
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Holzman, Allen L., to United States of America, Navy. Fluidic combustion control of a solid fuel ramjet. 4,137,712, Cl. 60-251.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
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White, William J., 4,137,625, Cl. 29-577.00C.
Hontgas, Christopher P.; and Smith, Benjamin D., to United States of America, Navy. Endothermic approach for desensitizing explosive ordnance. 4,137,849, Cl. 102-56.00R.
Hopper, Gene A. Filament cutter attachment. 4,137,694, Cl. 56-12.700.
Hori, Haruo: *See*—
Wada, Hajime; Kimura, Kazuhiko; Hori, Haruo; Kikuchi, Shoji; and Endo, Takaya, 4,138,264, Cl. 96-100.00R.
Horsch, Joachim, to International Harvester Company. Transmission clutches with sequence valve and piston-controlled pressure modulator. 4,138,004, Cl. 192-3.570.
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Howard, Curtis E.; Calvin, Douglas G.; and Pitts, Robert W., Jr., to Texaco Inc. Ignition system for an automatic burner for in situ combustion for enhanced thermal recovery of hydrocarbons from a well. 4,137,968, Cl. 166-53.000.
Howarth, Thomas T.; Brown, Allan G.; Corbett, David F.; and Ponsford, Roger J., to Beecham Group Limited. Azabicycloheptanes. 4,138,403, Cl. 260-307.0FA.
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Howell, Robert L.: *See*—
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Howorth Air Engineering Limited: *See*—
Howorth, Frederick H., 4,137,831, Cl. 98-36.000.
Howorth, Frederick H., to Howorth Air Engineering Limited. Clean air zone. 4,137,831, Cl. 98-36.000.
Hsieh, Henry L., to Phillips Petroleum Company. Polymerization of 1,3-cyclodiene with vinylaromatic hydrocarbon. 4,138,536, Cl. 526-19.000.
Huber, Bernhard W., to Bodenseewerk Perkin-Elmer & Co., GmbH. Method and apparatus for generating and transferring a gaseous test sample. 4,138,215, Cl. 422-58.000.
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Hudimac, George S., to Mechanical Service Co., Inc. Operator for microswitches. 4,138,603, Cl. 200-153.00T.
Hudspeth, Thomas; and Keeling, Harmon H., to Hughes Aircraft Company. Balanced synchronous parametric amplifier. 4,138,648, Cl. 330-4.900.
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Kubela, Rudolf; Musil, Vaclav; and Hughes, Lise A., 4,138,494, Cl. 424-274.000.

Hughey and Phillips, Inc.: *See*—
Camic, Donald L., 4,138,627, Cl. 315-313.000.
Huignard, Jean-Pierre; Herriau, Jean-Pierre; and Micheron, Francois, to Thomson-CSF. Holography using a $Bi_{12}SiO$ or $Bi_{12}GeO_{20}$ recording medium. 4,138,189, Cl. 350-3.640.
Humphrey, Donald F. Roadway barrier. 4,138,095, Cl. 256-64.000.
Humphries, Peter E., to Contronic Controls Limited. Four wire multisatellite intrusion alarm control system with tamper switch. 4,138,674, Cl. 340-506.000.
Hunger, Darrell M.; McGill, Lee E.; and von Alven, Raymond D., to Cutter Laboratories, Inc. Respiratory exerciser. 4,138,105, Cl. 272-99.000.
Hunt, Angus L.: *See*—
Goodman, Ronald K.; and Hunt, Angus L., 4,138,609, Cl. 250-396.00R.
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., to United States Borax & Chemical Corporation. Nitrophenylhydrazine compounds. 4,138,244, Cl. 71-121.000.
Husner, Walter: *See*—
Arnhold, Franz; and Husner, Walter, 4,137,746, Cl. 72-389.000.
Husson, Henri P.: *See*—
Thal, Claude; Besselievre, Richard; Husson, Henri P.; and Potier, Pierre, 4,138,489, Cl. 424-256.000.
Hutchins, Thomas B. Fluid conductivity measurement. 4,138,639, Cl. 324-30.00A.
Hydell, Robert C.: *See*—
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., 4,138,508, Cl. 427-54.000.
Hydro Pulse Corporation: *See*—
Wallach, Mark, 4,138,205, Cl. 417-360.000.
Iacono, Alfonso. Automatic draft control. 4,138,060, Cl. 236-1.00G.
Ichikawa, Yataro: *See*—
Ishimoto, Sachio; Yamaguchi, Hisao; Kato, Yoshinori; Oba, Takeo; Ozawa, Kenji; Ichikawa, Yataro; Nakagawa, Koji; and Tsuruta, Hideki, 4,138,553, Cl. 544-18.000.
ICN Pharmaceuticals, Inc.: *See*—
Christensen, Leon F.; and Witkowski, Joseph T., 4,138,547, Cl. 536-23.000.
Iga, Akira: *See*—
Doi, Toshitada; and Iga, Akira, 4,138,694, Cl. 358-127.000.
Igarashi, Akira, to Fuji Photo Film Co., Ltd. Thermochromic material. 4,138,357, Cl. 252-188.30R.
Iimura, Okinori, to Kewpie Kabushiki Kaisha. Coagulated egg-white foodstuffs. 4,138,507, Cl. 426-614.000.
Iizuka, Akio: *See*—
Mine, Junichi; Iizuka, Akio; Yoneshige, Tetsuhiko; and Ito, Hidefumi, 4,138,367, Cl. 252-466.0PT.
Iizuka, Yoshio, to Fujitsu Limited. Information density decision circuit. 4,138,693, Cl. 358-288.000.
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Umemura, Sumio; Matsui, Kanenobu; Ikeda, Yoshinari; and Masunaga, Katsuro, 4,138,580, Cl. 560-81.000.
Ikemoto, Zenichi; and Nishimura, Masaru, to Kawasaki Jukogyo Kabushiki Kaisha. Automatic fuel combustion control method and system. 4,138,725, Cl. 364-502.000.
Imahashi, Jinichi: *See*—
Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; Watanabe, Yoshihisa; Imanari, Makoto; and Nakajima, Fumito, 4,138,469, Cl. 423-239.000.
Imanari, Makoto: *See*—
Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; Watanabe, Yoshihisa; Imanari, Makoto; and Nakajima, Fumito, 4,138,469, Cl. 423-239.000.
Imperial Chemical Industries Limited: *See*—
Brittain, David R.; Brown, Edward D.; Hepworth, Walter; and Stacey, Gilbert J., 4,138,490, Cl. 424-258.000.
Jennings, James R.; Hogan, Philip J.; and Kelly, Lawrence F. M., 4,138,428, Cl. 260-465.80D.
McAinsh, James; and Rowe, Raymond C., 4,138,475, Cl. 424-19.000.
Nicks, Peter F., 4,138,376, Cl. 260-22.0TN.
Skilling, Derek, 4,138,458, Cl. 264-540.000.
Imperial Oil Limited: *See*—
Kaminsky, Victor; Trevoy, Lloyd W.; and Maskwa, Alvin, 4,138,467, Cl. 423-74.000.
Imperio, Charles D. Combined ratchet and torsion wrench. 4,137,801, Cl. 81-58.100.
Incom International Inc.: *See*—
Olsen, Roger F.; and Cantley, George, 4,137,799, Cl. 74-876.000.
Industrial Device Corporation: *See*—
Griffin, James A., 4,137,784, Cl. 74-89.150.
Ingle, William M.; and Thompson, Stephen W., to Motorola, Inc. Silicon purification process. 4,138,509, Cl. 427-86.000.
Innerspace Corporation: *See*—
Gongwer, Calvin A., 4,137,709, Cl. 60-204.000.
Inoue, Iwao: *See*—
Nakano, Masamitsu; and Inoue, Iwao, 4,138,655, Cl. 338-30.000.
Inouye, Kozo: *See*—
Hirose, Takeshi; Shiba, Keisuke; Yokota, Yukio; Inouye, Kozo; and Okumura, Akio, 4,138,258, Cl. 96-74.000.
Intercole Automation, Inc.: *See*—
Moses, Charles L., 4,138,207, Cl. 425-19.000.
International Business Machines Corporation: *See*—
Godard, Dominique N.; and Milewski, Andrzej T., 4,138,644, Cl. 325-320.000.
Heard, Roderick S.; Hill, James D.; and Phillips, David W., 4,138,688, Cl. 346-75.000.
Meeker, Robert G.; Scanlon, William J.; and Segal, Zvi, 4,138,692, Cl. 357-82.000.
Melcher, Robert L.; and von Gutfeld, Robert J., 4,137,991, Cl. 181-142.000.
Tung, Joseph S., 4,138,728, Cl. 364-565.000.
International Flavors & Fragrances Inc.: *See*—
Mookherjee, Braja D.; Evers, William J.; and Goossens, Alfred E., 4,138,413, Cl. 260-347.200.
International Harvester Company: *See*—
Horsch, Joachim, 4,138,004, Cl. 192-3.570.
Horstmann, Bernhard; and Wesemeier, Reinhard, 4,137,794, Cl. 74-606.00R.
Knapp, William H.; Phillips, Carmen S.; and Anderson, Walter A., 4,137,697, Cl. 56-341.000.
International Paper Company: *See*—
Capo, James L.; and Zint, Howard D., 4,138,041, Cl. 222-456.000.
Carlson, Richard W., 4,137,955, Cl. 141-349.000.
Neno, Gervais S., 4,138,311, Cl. 162-28.000.
International Rectifier Corporation: *See*—
Rodov, Vladimir, 4,138,280, Cl. 148-186.000.
International Telephone and Telegraph Corporation: *See*—
Ashford, Donald A., 4,138,597, Cl. 179-15.0AS.
De Lorme, James F.; and Tuppen, Arthur R., 4,138,680, Cl. 343-105.00R.
Intonation Systems: *See*—
Stone, Thomas D.; Felgen, Michael J.; and de Man, Heiko T., 4,137,813, Cl. 84-314.000.
Ireland, James S.: *See*—
Arms, Milo F.; and Ireland, James S., 4,138,333, Cl. 195-127.000.
Isaoka, Shin-Ichi: *See*—
Kawakami, Shigenao; Shibata, Tatsumi; Isaoka, Shin-Ichi; and Shintani, Tutomu, 4,138,446, Cl. 260-875.000.
Ishihara Sangyo Kaisha Ltd.: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Nagatani, Kuniaki; and Nishimura, Shigeyuki, 4,138,436, Cl. 260-581.000.
Ishijima, Shizuo; and Doi, Tsunesuke, to Asahi Kasei Kogyo Kabushiki Kaisha. Aqueous aluminum paste composition. 4,138,270, Cl. 106-291.000.
Ishikawa, Fumiyoshi; Kosasayama, Akira; Watanabe, Yoshifumi; Abiko, Yasushi; Kameda, Kin-ya; and Ono, Shin-etu, to Daiichi Seiyaku Co., Ltd. Method for treating diabetes. 4,138,491, Cl. 424-263.000.
Ishikawa, Katuhiro: *See*—
Arakawa, Masatoshi; Ohno, Ryotaro; Ishikawa, Katuhiro; Yamahara, Noboru; and Matsui, Hisashi, 4,138,419, Cl. 260-429.00R.
Ishikawa, Youhei: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Tamura, Sadahiro, 4,138,652, Cl. 333-82.00R.
Ishimoto, Sachio; Yamaguchi, Hisao; Kato, Yoshinori; Oba, Takeo; Ozawa, Kenji; Ichikawa, Yataro; Nakagawa, Koji; and Tsuruta, Hideki, to Teijin Limited. 3-Methylene cephalosporanic acid derivatives and process for preparation thereof. 4,138,553, Cl. 544-18.000.
Ishizuka, Akio; and Miyamoto, Akio, to Fuji Photo Film Co., Ltd. Color image forming system including a layer formed from a dried residue of a developing ink containing a polyester resin binder. 4,138,522, Cl. 428-195.000.
Itani, Seiichi, to Kubota, Ltd. Electronic weighing apparatus. 4,137,979, Cl. 177-210.00R.
Itatani, Hiroshi: *See*—
Yamasaki, Toshiharu; Eguchi, Masao; Uchiumi, Schinichiro; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, 4,138,587, Cl. 560-204.000.
Ito, Hidefumi: *See*—
Mine, Junichi; Iizuka, Akio; Yoneshige, Tetsuhiko; and Ito, Hidefumi, 4,138,367, Cl. 252-466.0PT.
Ito, Shunji: *See*—
Kajinaga, Yoshihiro; Sakurada, Ichio; and Ito, Shunji, 4,138,250, Cl. 75-201.000.
Itoh, Kenichiro, to Yoshida Kogyo K K. Slide fastener and a method of attaching the same to a garment. 4,137,859, Cl. 112-265.000.
Itoh, Kiyoo, to Hitachi, Ltd. Memory system. 4,138,740, Cl. 365-203.000.
Itoh, Toshiharu, to Kabushiki Kaisha Osaka Jidoki Seisakusho. Device for selecting and removing unsatisfactory capsules before filling satisfactory capsules with chemicals. 4,138,017, Cl. 209-680.000.
ITT Industries, Inc.: *See*—
Belart, Juan, 4,137,718, Cl. 60-551.000.
IVAC Corporation: *See*—
Georgi, Heinz W., 4,137,913, Cl. 128-214.00F.
Iwans, Robert C.; and Lamb, Richard C., to Koehler-Dayton, Inc. Toilet. 4,137,580, Cl. 4-420.000.
Iwasaki, Masami: *See*—
Nawa, Keiji; and Iwasaki, Masami, 4,138,690, Cl. 357-46.000.
Izu, Masatsugu: *See*—
Wacks, Harvey H.; Izu, Masatsugu; and Sarrach, Donald J., 4,138,262, Cl. 96-87.00R.
Izumi Seimitsu-Kogyo Kabushiki Gaisha: *See*—
Yamazaki, Tadashi, 4,137,629, Cl. 30-43.500.
J. M. Eltzroth & Associates, Inc.: *See*—
Miller, Russell C., 4,138,276, Cl. 148-6.200.
J. M. Huber Corporation: *See*—
Lamond, Trevor G.; and Wells, John L., 4,138,471, Cl. 423-460.000.

J. M. Voith GmbH: *See*—
Velinsky, Johannes; and Bahr, Theodor, 4,138,338, Cl. 210-327.000.

Jacob, Solomon M.: *See*—
Chang, Clarence D.; Jacob, Solomon M.; Silvestri, Anthony J.; and Zahner, John C., 4,138,440, Cl. 260-668.00R.

Jacobsson, Kurt A. G., to Aktiebolaget IRO. Thread supply device for textile machine having common thread control and tension sensing element. 4,137,731, Cl. 66-132.00R.

Jaconette, Frank C., Jr., to Harvey Hubbell, Incorporated. Electric cord clamp device. 4,138,185, Cl. 339-107.000.

Jaeschke, Ralph L., to Eaton Corporation. Spread pole eddy current coupling. 4,138,618, Cl. 310-105.000.

James Mackie & Sons Limited: *See*—
Mackie, Gordon, 4,138,070, Cl. 242-18.00A.

Jan, Gerald: *See*—
Chylewski, Christoph; Jan, Gerald; Kurzen, Roland; Meier, Max; and Schellenberg, Matthias, 4,138,256, Cl. 96-53.000.

Janis, Zbig. Sports tethered ball practice device. 4,138,107, Cl. 273-29.00A.

Janisch, Gerhard: *See*—
Sander, Bruno; Mueller, Albrecht; Merkle, Hans; and Janisch, Gerhard, 4,138,269, Cl. 106-90.000.

Janner, Karl; Gregorius, Klaus; and Stehle, Heinz, to Kraftwerk Union Aktiengesellschaft. Method for isotope separation by means of coherent electromagnetic radiation. 4,138,297, Cl. 204-157.10R.

Jansen, William D.; Haney, Jerry D.; Day, Christopher C.; and Schneeberger, Stephen A., to American Optical Corporation. Systolic pressure determining apparatus and process using integration to determine pulse amplitude. 4,137,907, Cl. 128-2.05M.

Janssen, Almuth, legal representative: *See*—
Janssen, Paul, deceased; Meyer, Gunther; Thewalt, Klaus; and Schmidt, Reinhard, 4,138,544, Cl. 528-272.000.

Janssen, Paul, deceased (by Janssen, Almuth, legal representative); Meyer, Gunther; Thewalt, Klaus; and Schmidt, Reinhard, to Dynamit Nobel Aktiengesellschaft. The preparation of polycondensate by one-step melt condensation in a vacuum. 4,138,544, Cl. 528-272.000.

Jansson, Janne K. G.; and Skottheim, Leif H., to Jofa AB. Protective glove, especially intended for ice hockey players. 4,137,572, Cl. 2-16.000.

Japan Atomic Energy Research Institute: *See*—
Kaetsu, Isao; Okubo, Hiroshi; and Yoshii, Fumio, 4,138,300, Cl. 204-159.220.
Kaetsu, Isao; Okubo, Hiroshi; and Yoshii, Fumio, 4,138,538, Cl. 526-73.000.

Japan Ships Machinery Development Association: *See*—
Suzuki, Masao; and Yamajo, Tsutomu, 4,138,340, Cl. 210-396.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Arai, Kozo; Fukui, Shiomi; Nagata, Masaki; and Kotani, Teizo, 4,138,369, Cl. 252-512.000.
Arakawa, Masatoshi; Ohno, Ryotaro; Ishikawa, Katuhiro; Yamahara, Noboru; and Matsui, Hisashi, 4,138,419, Cl. 260-429.00R.

Jaudt, Andreas. Adjustable packing assembly. 4,138,126, Cl. 277-191.000.

Jaworski, Eugene, to Marvin Glass & Associates. Holster-shaped device for firing projectiles. 4,137,892, Cl. 124-10.000.

Jeanmart, Claude: *See*—
Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,138,487, Cl. 424-250.000.

Jefferson, Donald E.: *See*—
Uffner, Melville W.; Jefferson, Donald E.; Coe, Charles G.; and Beitchman, Burton D., 4,138,385, Cl. 260-40.00R.

Jennings, Frederick R.; and Moritz, James O. Self-guided automatic load transporter. 4,137,984, Cl. 180-98.000.

Jennings, James R.; Hogan, Philip J.; and Kelly, Lawrence F. M., to Imperial Chemical Industries Limited. Dimerization process. 4,138,428, Cl. 260-465.80D.

Jeschke, Willi, to Heidelberger Druckmaschinen Aktiengesellschaft. Device for adjusting lateral and circumferential register in rotary printing machines. 4,137,845, Cl. 101-248.000.

Jespersen, Paul W.: *See*—
DeLuca, Raymond F.; and Jespersen, Paul W., 4,137,805, Cl. 83-345.000.

Jidoshakiki Co., Ltd.: *See*—
Takeshima, Sadao, 4,138,708, Cl. 361-156.000.

Jofa AB: *See*—
Jansson, Janne K. G.; and Skottheim, Leif H., 4,137,572, Cl. 2-16.000.

Johansson, Gert A. Identification procedure for suspended articles of clothing and carrier for application of the procedure. 4,137,661, Cl. 40-322.000.

Johansson, Thore R. H.: *See*—
Hedenas, Bo G. V.; Wiklund, Johan E.; Johansson, Thore R. H.; and Melkersson, Karl-Axel, 4,138,231, Cl. 55-71.000.

Johnson, David E.: *See*—
Colombo, Edward A.; Johnson, David E.; and Tsai, James T., 4,137,754, Cl. 73-56.000.

Johnson, Herbert E.: *See*—
Chan, John K.; Tobler, Erich; and Johnson, Herbert E., 4,138,422, Cl. 260-453.0RW.

Johnson & Johnson: *See*—
Turner, Robert B., 4,138,616, Cl. 307-310.000.

Johnson, Lauren L.; and Wilson, Robert J., to General Motors Corporation. Electrical power supply fault detecting system. 4,138,706, Cl. 361-42.000.

Johnson, Robert E., to Sterling Drug Inc. 1-(Arylamino)-and 1-(arylimino)pyrroles. 4,138,405, Cl. 260-326.50C.

Johnson, Sven J. Sonic motor. 4,138,659, Cl. 340-8.00R.

Jones, Eldon D. Dump body brace. 4,138,158, Cl. 298-17.00B.

Jones, Henry B.: *See*—
Colvert, James H.; MacLean, John P.; Williams, Dale; and Jones, Henry B., 4,138,219, Cl. 422-144.000.

Jordan, Wilmer C. Apparatus using exhaust gas for fuel vaporization. 4,137,881, Cl. 123-122.0AA.

Jousson, Pierre J., to Les Produits Associes LPA S.A. Hydraulic apparatus for body care. 4,137,911, Cl. 128-66.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Tanaka, Kojiro, 4,138,613, Cl. 307-247.00A.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kubota, Ichiro, 4,137,840, Cl. 100-209.000.

Kabushiki Kaisha Meidensha: *See*—
Amano, Kenichi; and Furuya, Noboru, 4,138,638, Cl. 324-29.000.

Kabushiki Kaisha Osaka Jidoki Seisakusho: *See*—
Itoh, Toshiharu, 4,138,017, Cl. 209-680.000.

Kabushiki Kaisha Seikosha: *See*—
Moritani, Nakanobu, 4,137,676, Cl. 51-165.00R.

Kachkov, Nikolai P.: *See*—
Kazurov, Alexandr A.; Pevzner, Leonid M.; Mikhalina, Alexandra E.; Kachkov, Nikolai P.; Lapshinov, Georgy S.; Sedov, Nikolai S.; Kainkov, Nikolai P.; and Anisimov, Stanislav M., 4,137,951, Cl. 139-68.000.

Kaetsu, Isao; Okubo, Hiroshi; and Yoshii, Fumio, to Japan Atomic Energy Research Institute. Process for producing a transparent shaped polymeric product. 4,138,300, Cl. 204-159.220.

Kaetsu, Isao; Okubo, Hiroshi; and Yoshii, Fumio, to Japan Atomic Energy Research Institute. Process for producing a transparent shaped polymeric product. 4,138,538, Cl. 526-73.000.

Kageyama, Gengo; and Kamite, Junji, to Toyo Kogyo Co., Ltd. Exhaust gas recirculation means. 4,137,879, Cl. 123-119.00A.

Kahn, Henry. Root canal practice model. 4,137,633, Cl. 32-71.000.

Kainkov, Nikolai P.: *See*—
Kazurov, Alexandr A.; Pevzner, Leonid M.; Mikhalina, Alexandra E.; Kachkov, Nikolai P.; Lapshinov, Georgy S.; Sedov, Nikolai S.; Kainkov, Nikolai P.; and Anisimov, Stanislav M., 4,137,951, Cl. 139-68.000.

Kajikawa, Shuji: *See*—
Mochizuki, Toshio; Kajikawa, Shuji; Hirai, Keitaro; and Yasunaga, Masaaki, 4,138,022, Cl. 214-35.00R.

Kajinaga, Yoshihiro; Sakurada, Ichio; and Ito, Shunji, to Kawasaki Steel Corporation. Method for producing metal block having a high density with metal powder. 4,138,250, Cl. 75-201.000.

Kakehashi, Ikutaro, to Roland Corporation. Electrical string-instrument. 4,137,811, Cl. 84-1.160.

Kaken Chemical Co., Ltd.: *See*—
Shibata, Akira; Miyazaki, Yukio; Tsuda, Kiyoshi; Otake, Noboru; and Kinashi, Haruyasu, 4,138,496, Cl. 424-283.000.

Kakita, Hideto: *See*—
Sato, Hiroshi; Nakatani, Munetsugu; Nakatsui, Hiroshi; Kakita, Hideto; Shimoyama, Hiroyuki; Mochida, Naoki; and Sugimori, Shuichi, 4,138,520, Cl. 428-141.000.

Kalka, Josef; and Beckmann, Jurgen, to Chemische Werke Huels Aktiengesellschaft. Continuous process for the removal of residual monomer from aqueous dispersions of homo- and copolymers of vinyl chloride. 4,138,310, Cl. 159-47.00R.

Kameda, Kin-ya: *See*—
Ishikawa, Fumiyoshi; Kosasayama, Akira; Watanabe, Yoshifumi; Abiko, Yasushi; Kameda, Kin-ya; and Ono, Shin-etu, 4,138,491, Cl. 424-263.000.

Kamen, Dean. Flow control for an intravenous feeding system. 4,137,915, Cl. 128-214.00E.

Kamimoto, Shigemi; Hayashi, Toshio; and Shimizu, Kazuyuki, to Fujitsu Limited. High speed binary and binary coded decimal adder. 4,138,731, Cl. 364-783.000.

Kaminsky, Victor; Trevoy, Lloyd W.; and Maskwa, Alvin, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity; Ontario Energy Corporation; Imperial Oil Limited; Canada-Cities Service, Ltd.; and Gulf Oil Canada Limited. Method for concentrating heavy minerals in the solids tailings from hot water extraction of tar sands. 4,138,467, Cl. 423-74.000.

Kamite, Junji: *See*—
Kageyama, Gengo; and Kamite, Junji, 4,137,879, Cl. 123-119.00A.

Kampfer, Robert D.; and Dierssen, Gunther H., to Minnesota Mining and Manufacturing Company. Thermomechanical candle snuffer. 4,138,211, Cl. 431-35.000.

Kanner, Bernard: *See*—
Prokai, Bela; and Kanner, Bernard, 4,138,391, Cl. 260-465.600.

Kao, Wenling, to American Home Products Corporation. Prostaglandin derivatives. 4,138,590, Cl. 562-503.000.

Kaplan, Lennart P.: *See*—
Andersson, Lars-Olov; Einarsson, Gudrun M.; and Kaplan, Lennart P., 4,138,287, Cl. 195-1.500.

Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Kohl, Karl, 4,137,734, Cl. 66-214.000.

Karlin, Richard A.; and Rim, Kirk K. O. K., to Sun Electric Corporation. Instrument amplifier and load driver having offset elimination and common mode rejection. 4,138,641, Cl. 324-123.00R.

Karlsson, Ingemar, to Aktiebolaget Svenska Flaktfabriken. Treating airborne web material. 4,137,644, Cl. 34-23.000.

Karlsson, Per-Olle, to Granges Oxelosunds Jarnverk AB. Method and apparatus for producing metal blanks, in particular steel slabs, which at least in a predetermined surface area have substantially no defects. 4,138,277, Cl. 148-9.500.

Kartte, Klaus: *See*—
Neubauer, Gerald; Van Wauwe, Gerard; Beullens, Josef; Brand, Uwe; Fuchs, Hugo; and Kartte, Klaus, 4,138,472, Cl. 423-549.000.

Kascha, Waldemar: *See*—
Tummes, Hans; Noeske, Heinz; Cornils, Boy; and Kascha, Waldemar, 4,138,588, Cl. 568-881.000.

Kashihara, Kanzi: *See*—
Nogi, Tatsuo; Yoshizawa, Yasuo; Kashihara, Kanzi; Yoshizumi, Nobuo; and Tsuda, Yoshizo, 4,138,445, Cl. 260-844.000.

Kasuga, Hisao: *See*—
Bonkohara, Manabu; and Kasuga, Hisao, 4,138,691, Cl. 357-70.000.

Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; Watanabe, Yoshihisa; Imanari, Makoto; and Nakajima, Fumito, to Mitsubishi Petrochemical Co., Ltd.; Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Process for catalytically treating exhaust gas containing NO_x in the presence of ammonia gas. 4,138,469, Cl. 423-239.000.

Kato, Yoshinori: *See*—
Ishimoto, Sachio; Yamaguchi, Hisao; Kato, Yoshinori; Oba, Takeo; Ozawa, Kenji; Ichikawa, Yataro; Nakagawa, Koji; and Tsuruta, Hideki, 4,138,553, Cl. 544-18.000.

Katsura, Hidetoshi: *See*—
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makoto; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,138,714, Cl. 362-231.000.

Katsurayama, Tadashi; and Nakamuro, Yoshio, to Suzuka Paint Manufacturing Company, Limited. Film material for forming blackboards. 4,138,523, Cl. 428-216.000.

Kawada, Yoshinosuke: *See*—
Koizumi, Hisao; Kawada, Yoshinosuke; Murasaki, Hiroaki; and Hisaoka, Satoshi, 4,137,898, Cl. 126-270.000.

Kawai, Misao: *See*—
Kiyomiya, Makoto; and Kawai, Misao, 4,138,368, Cl. 252-470.000.

Kawakami, Shigenao; Shibata, Tatsumi; Isaoka, Shin-Ichi; and Shintani, Tutomu, to Sumitomo Chemical Company, Limited. Water-soluble high polymers and their preparation. 4,138,446, Cl. 260-875.000.

Kawakami, Toshikazu: *See*—
Yoshida, Mitsutaka; and Kawakami, Toshikazu, 4,137,883, Cl. 123-148.00P.

Kawamoto, Koichi: *See*—
Aoyama, Hideki; and Kawamoto, Koichi, 4,138,072, Cl. 242-35.50A.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Ikemoto, Zenichi; and Nishimura, Masaru, 4,138,725, Cl. 364-502.000.

Kawasaki Steel Corporation: *See*—
Kajinaga, Yoshihiro; Sakurada, Ichio; and Ito, Shunji, 4,138,250, Cl. 75-201.000.

Kawashima, Isao: *See*—
Nakajima, Heitaro; Omura, Yoshimoto; and Kawashima, Isao, 4,138,121, Cl. 274-23.00R.

Kawauchi, Yasunobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Control systems of ozonizer systems. 4,138,724, Cl. 364-500.000.

Kazurov, Alexandr A.; Pevzner, Leonid M.; Mikhalina, Alexandra E.; Kachkov, Nikolai P.; Lapshinov, Georgy S.; Sedov, Nikolai S.; Kainkov, Nikolai P.; and Anisimov, Stanislav M. Apparatus for controlling actuating mechanism of loom dobby. 4,137,951, Cl. 139-68.000.

Kedzierski, Stanley G., to Textron Inc. Locking slider for a slide fastener. 4,137,609, Cl. 24-205.14A.

Keeling, Harmon H.: *See*—
Hudspeth, Thomas; and Keeling, Harmon H., 4,138,648, Cl. 330-4.900.

Keeling, Tracy: *See*—
Harmon, Thomas; and Keeling, Tracy, 4,138,454, Cl. 264-39.000.

Keller, Ernst. Lock cylinder for a safety lock. 4,137,739, Cl. 70-358.000.

Kellerman, Richard, to Xerox Corporation. Recording with imagewise alteration of magnetic attraction of donor. 4,138,685, Cl. 346-74.100.

Kelley, Robert V. Buoyant pellet covering for swimming pools. 4,137,612, Cl. 126-271.000.

Kellogg Company: *See*—
Fulger, Charles V.; and Dewey, James E., 4,138,500, Cl. 426-46.000.

Kelly, Lawrence F. M.: *See*—
Jennings, James R.; Hogan, Philip J.; and Kelly, Lawrence F. M., 4,138,428, Cl. 260-465.80D.

Kendall, Willard E.: *See*—
Frankel, Donald P.; Kendall, Willard E.; and Cooper, John F., 4,138,331, Cl. 210-63.00R.

Kennedy, Alvin B., Jr. Unloading device. 4,138,025, Cl. 214-318.000.

Kennedy, Joseph P.; and Castner, Kenneth F. Synthesis of substituted cyclopentadienes and cyclopentadiene-functionalized polymers. 4,138,441, Cl. 260-666.00A.

Kepchar, Michael W., to General Time Corporation. Means for connecting a display in a circuit. 4,138,672, Cl. 340-378.100.

Kern, Georg, to Dyckerhoff & Widmann Aktiengesellschaft. Steel rods with hot rolled ribs formed in a partial spiral. 4,137,686, Cl. 52-734.000.

Kerr, John L., to United States of America, Army. Loaded microstrip antenna with integral transformer. 4,138,684, Cl. 343-846.000.

Kerr, Ronald R.: *See*—
Mullins, Keith M.; Leppert, Thomas K.; Cannon, Thomas; Kerr, Ronald R.; and Smith, Ronn G., 4,138,066, Cl. 241-86.000.

Kerwin, William J.: *See*—
McCormick, J. Byron; Depp, Steven W.; Hamilton, Douglas J.; and Kerwin, William J., 4,138,622, Cl. 313-306.000.

Kessler, Norbert; and Robbins, John M., to Black Clawson Company, The. Fabric stringing method for non-cantilevered fourdrinier machine. 4,138,316, Cl. 162-200.000.

Kessler, Wilbur. Carpenter's portable precision adjustable length cutting gauge. 4,137,637, Cl. 33-94.000.

Kettner, Roland; and Unland, Herbert, to Mobil Oil Corporation. Method and apparatus for producing or recovering alkanolamine from a mixture containing oxazolidone. 4,138,468, Cl. 423-228.000.

Kewpie Kabushiki Kaisha: *See*—
Iimura, Okinori, 4,138,507, Cl. 426-614.000.

Khalafalla, Sanna E.: *See*—
Pahlman, John E.; and Khalafalla, Sanna E., 4,138,465, Cl. 423-49.000.

Khodzhakhanov, Nabi A.; Makhmudov, Takhir M.; and Akhmedov, Karim S. Methods of preparing anion surface-active substances. 4,138,425, Cl. 260-458.00C.

Kikuchi, Rokuro: *See*—
Odazima, Mituo; Kikuchi, Rokuro; and Ataka, Arata, 4,137,884, Cl. 123-149.00D.

Kikuchi, Shoji: *See*—
Wada, Hajime; Kimura, Kazuhiko; Hori, Haruo; Kikuchi, Shoji; and Endo, Takaya, 4,138,264, Cl. 96-100.00R.

Kikuchi, Toshimoto: *See*—
Koyama, Kaoru; Kyuzaki, Tsutomu; and Kikuchi, Toshimoto, 4,138,625, Cl. 315-3.500.

Killman, Don M.; and Robinson, Thomas P., to Travenol Laboratories, Inc. Catheter plug assembly. 4,137,916, Cl. 128-214.400.

Kimmell, Steven D.; and Stansbury, Benjamin H., Jr., to Mattel, Inc. Two wheel roller skate or the like. 4,138,127, Cl. 280-11.230.

Kimura, Kazuhiko: *See*—
Wada, Hajime; Kimura, Kazuhiko; Hori, Haruo; Kikuchi, Shoji; and Endo, Takaya, 4,138,264, Cl. 96-100.00R.

Kinashi, Haruyasu: *See*—
Shibata, Akira; Miyazaki, Yukio; Tsuda, Kiyoshi; Otake, Noboru; and Kinashi, Haruyasu, 4,138,496, Cl. 424-283.000.

King, Henry L.; and Wu, Chester C., to Monsanto Company, St. Louis, Missouri. Catalyst for polyesters and method for making the same. 4,138,364, Cl. 252-431.00N.

Kinoshita, Yoshihiko. Method and device for drawing a rolled photographic film's end out of its cartridge. 4,138,068, Cl. 242-1.000.

Kinsman, Gordon F., to Polaroid Corporation. Method of making flat batteries. 4,137,627, Cl. 29-623.400.

Kipping, Vernon L. System and method for production of marine food using submerged platform. 4,137,869, Cl. 119-3.000.

Kircher, Andrew J. Window construction. 4,137,672, Cl. 49-464.000.

Kirner, Ernest O., to Bendix Corporation, The. Integrity monitoring system for an aircraft navigation system. 4,138,678, Cl. 343-17.700.

Kita, Norio, to Hitachi, Ltd. Method of treating waste water of a nuclear power plant and a system therefor. 4,138,329, Cl. 210-26.000.

Kita, Yasuo, to Shimadzu Seisakushi, Ltd. Piston pump. 4,137,826, Cl. 91-497.000.

Kiyomiya, Makoto; and Kawai, Misao, to Director General of Agency of Industrial Science and Technology. Catalyst for reducing nitrogen oxides. 4,138,368, Cl. 252-470.000.

Klaffke, Friedemann; and Heckel, Klaus, to Carl Freudenberg, Firma. Swimming pool tarpaulin. 4,137,575, Cl. 4-172.120.

Klamar, John. Universal custom fit garment patterns and method of using the same. 4,137,634, Cl. 33-12.000.

Klaus, Harald: *See*—
Kramer, Friedhelm; Wolfertz, Gunter; Klaus, Harald; Stanik, Raimund; and Ramspott, Walter, 4,137,607, Cl. 24-95.000.

Klein, Andrew: *See*—
Barabas, Eugene S.; and Klein, Andrew, 4,138,380, Cl. 260-29.60Z.

Kleiner, Hans-Jerg; and Finke, Manfred, to Hoechst Aktiengesellschaft. Process for preparing 1,2-oxa-phospholanes. 4,138,433, Cl. 260-545.00P.

Klemmensen, Per D.; Kolind-Andersen, Hans; and Madsen, Hans B., to A/S Cheminova. Production of chrysanthemic acid esters and homologues thereof. 4,138,584, Cl. 560-124.000.

Klipsch and Associates, Inc.: *See*—
Klipsch, Paul W., 4,138,594, Cl. 179-1.00E.

Klipsch, Paul W., to Klipsch and Associates, Inc. Small dimension low frequency folded exponential horn loudspeaker with unitary sound path and loudspeaker system including same. 4,138,594, Cl. 179-1.00E.

Kloc, Hyman. Multi-tone musical drum. 4,137,815, Cl. 84-408.000.

Klose, Odo, to Werkzeug-Union GmbH-DWU. Pincers. 4,137,630, Cl. 30-186.000.

Kluge, Albert D.: *See*—
Cina, Ronald A.; and Kluge, Albert D., 4,137,675, Cl. 51-164.00R.

Klumpp, Ferdinand, Jr., to Heyman Manufacturing Company. Multipurpose bushing and aperture locking system. 4,137,602, Cl. 16-2.000.

Knapp, William H.; Phillips, Carmen S.; and Anderson, Walter A., to International Harvester Company. Bale density structure for cylindrical balers. 4,137,697, Cl. 56-341.000.

Knopp, Chauncey D., to AMP Incorporated. Terminating means for a multi-wire cable. 4,138,184, Cl. 339-97.00P.

Knowles, Daniel H.: *See*—
Bonzo, Roy T.; and Knowles, Daniel H., 4,138,069, Cl. 242-18.00A.

Kobayashi, Tsutomu: *See*—
George, Peter K.; and Kobayashi, Tsutomu, 4,138,736, Cl. 365-12.000.

Koboshi, Sigeharu: *See*—
Fushiki, Isamu; Koboshi, Sigeharu; and Terada, Sadatugu, 4,138,257, Cl. 96-60.0BF.

Koch, George P., to Fiat-Allis Construction Machinery, Inc. Combined steering and braking means for crawler tractor. 4,137,944, Cl. 137-596.000.

Koehler-Dayton, Inc.: *See*—
Iwans, Robert C.; and Lamb, Richard C., 4,137,580, Cl. 4-420.000.

Kohl, Karl, to Karl Mayer Textilmaschinenfabrik GmbH. Jacquard controlled warp knitting machines and yarn guide units therefor. 4,137,734, Cl. 66-214.000.

Koizumi, Hisao; Kawada, Yoshinosuke; Murasaki, Hiroaki; and Hisaoka, Satoshi, to Tokyo Shibaura Electric Co., Ltd. Air type solar heating system. 4,137,898, Cl. 126-270.000.

Kojima, Toshitake: *See*—
Ogawa, Masanobu; and Kojima, Toshitake, 4,138,365, Cl. 252-435.000.

Kojo, Dairoku. Flower-pot. 4,137,668, Cl. 47-66.000.

Kokei, Akira, to Matsushita Electric Industrial Co., Ltd. Magnetic tape control system. 4,138,698, Cl. 360-74.000.

Koken Co., Ltd.: *See*—
Akiyama, Taichiro; and Muto, Haruomi, 4,137,906, Cl. 128-2.00A.

Kokusan Denki Co., Ltd.: *See*—
Yukawa, Hideki, 4,138,634, Cl. 322-28.000.

Kolind-Andersen, Hans: *See*—
Klemmensen, Per D.; Kolind-Andersen, Hans; and Madsen, Hans B., 4,138,584, Cl. 560-124.000.

Koller, Stefan, to Ciba-Geigy Corporation. Pyridyl-azo-indolyl cationic dyes. 4,138,396, Cl. 260-156.000.

Kondis, Thomas J.: *See*—
Rolles, Rolf; Williams, James E., Jr.; and Kondis, Thomas J., 4,138,511, Cl. 427-201.000.

Kongo Co., Ltd.: *See*—
Taniwaki, Genshi, 4,138,173, Cl. 312-198.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fushiki, Isamu; Koboshi, Sigeharu; and Terada, Sadatugu, 4,138,257, Cl. 96-60.0BF.
Wada, Hajime; Kimura, Kazuhiko; Hori, Haruo; Kikuchi, Shoji; and Endo, Takaya, 4,138,264, Cl. 96-100.00R.

Konkov, Vyacheslav S.: *See*—
Muratov, Rustem I.; Kot, Jury D.; Belov, Mikhail F.; Gildengorn, Melis S.; Konkov, Vyacheslav S.; and Erlikh, Mikhail I., 4,137,745, Cl. 72-263.000.

Koppers Company, Inc.: *See*—
Siegert, Daniel H.; and Banki, Steven, 4,137,999, Cl. 184-45.00R.

Koresawa, Takeshi; and Yoden, Eiji, to Dai-Ichi Croda Chemicals Kabushiki Kaisha. Non-allergenic lanolin and production of same. 4,138,416, Cl. 260-397.250.

Koriyama, Hideaki: *See*—
Arisato, Yasunori; and Koriyama, Hideaki, 4,138,267, Cl. 106-1.230.

Kornylak Corporation: *See*—
Harmon, Thomas; and Keeling, Tracy, 4,138,454, Cl. 264-39.000.

Korp, Walter D. Bed clothing. 4,137,582, Cl. 5-334.00C.

Korten, Chauncey F. Combination knob for fishing reels. 4,138,075, Cl. 242-84.10J.

Kosasayama, Akira: *See*—
Ishikawa, Fumiyoshi; Kosasayama, Akira; Watanabe, Yoshifumi; Abiko, Yasushi; Kameda, Kin-ya; and Ono, Shin-etu, 4,138,491, Cl. 424-263.000.

Kot, Jury D.: *See*—
Muratov, Rustem I.; Kot, Jury D.; Belov, Mikhail F.; Gildengorn, Melis S.; Konkov, Vyacheslav S.; and Erlikh, Mikhail I., 4,137,745, Cl. 72-263.000.

Kotani, Teizo: *See*—
Arai, Kozo; Fukui, Shiomi; Nagata, Masaki; and Kotani, Teizo, 4,138,369, Cl. 252-512.000.

Kovacs, Austin, to United States of America, Army. Compression testing apparatus. 4,137,757, Cl. 73-860.000.

Koyama, Kaoru; Kyuzaki, Tsutomu; and Kikuchi, Toshimoto, to Nippon Electric Co., Ltd. Helix type travelling-wave tube amplifier. 4,138,625, Cl. 315-3.500.

Kozlol, Jeffrey E.: *See*—
Peyman, Gholam A.; Koziol, Jeffrey E.; Fried, Walter I.; and Sanders, Donald R., 4,138,191, Cl. 350-19.000.

Koziol, Konrad; Rathjen, Hans-Carl; and Sieberer, Karl-Heinz, to C. Conradty, Firma. Metal anode for electrochemical processing and method of making same. 4,138,510, Cl. 427-124.000.

Krafft, Werner; and Helling, Gunter, to Agfa-Gevaert Aktiengesellschaft. Photographic film unit with crosslinked neutralization layer. 4,138,260, Cl. 96-77.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Janner, Karl; Gregorius, Klaus; and Stehle, Heinz, 4,138,297, Cl. 204-157.10R.
Schabert, Hans-Peter; and Bohm, Bernhard, 4,138,319, Cl. 176-65.000.
Scholz, Manfred; and Gollasch, Bernd, 4,138,321, Cl. 176-87.000.
Wustenberg, Hermann; and Schulz, Eduard, 4,137,779, Cl. 73-627.000.

Kramer, Friedhelm; Wolfertz, Gunter; Klaus, Harald; Stanik, Raimund; and Ramspott, Walter, to Schaeffler-Homberg GmbH. Button, particularly for clothing pieces. 4,137,607, Cl. 24-95.000.

Krauss, Dieter, to Erma-Werke Waffen- und Maschinenfabrik GmbH. Friction bearing and method of making such a bearing. 4,137,618, Cl. 29-149.50S.

Krautkramer-Branson, Incorporated: *See*—
Primbsch, Erik, 4,137,778, Cl. 73-627.000.

Kreitzberg, Ernest A.; and Zajichek, William J., to Allis-Chalmers Corporation. Rotatable pivotal transmission shift lever. 4,137,791, Cl. 74-473.00R.

Krempl, Engelbert: *See*—
Strauss, Julius; Hubner, Herbert; Muller, Heinz; and Krempl, Engelbert, 4,138,437, Cl. 260-583.00R.

Krimmel, Carl P., to G. D. Searle & Co. Piperazinyl cyclobutenones. 4,138,566, Cl. 544-357.000.

Kroeger, Daniel E. Urine specimen collector. 4,137,573, Cl. 4-144.100.

Krohne, Chris W.: *See*—
Hacker, John R.; Krohne, Chris W.; and Miller, William H., 4,138,181, Cl. 339-45.00R.

Krueger, Achim R.: *See*—
Chang, David C.; Fryd, Michael; and Krueger, Achim R., 4,138,381, Cl. 260-29.6TA.

Krummenacher, Josef, to Apparate- und Werkzengbau AG. Vice, particularly parallel vice. 4,138,100, Cl. 269-137.000.

Kruse, John M.; and Gelnett, Leland E., to Rockwell International Corporation. Axial flow throttling valve. 4,138,087, Cl. 251-5.000.

Kryzhny, Evgeny A.: *See*—
Statsenko, Nikolai N.; Kuzub, Vladislav S.; Moisa, Vladimir G.; and Kryzhny, Evgeny A., 4,138,323, Cl. 204-196.000.

KSB Kernkraftwerkspumpen GmbH: *See*—
Dernedde, Robert; and Schneider, Wolfgang, 4,138,201, Cl. 415-219.00C.

Kubela, Rudolf; Musil, Vaclav; and Hughes, Lise A., to Delmar Chemicals Limited. 3-Phenylindolines. 4,138,494, Cl. 424-274.000.

Kubesa, Frantisek, to UOP Inc. Holder for annular filter. 4,138,234, Cl. 55-374.000.

Kubota, Ichiro, to Kabushiki Kaisha Komatsu Seisakusho. Mechanical press having twin working stations. 4,137,840, Cl. 100-209.000.

Kubota, Ltd.: *See*—
Itani, Seiichi, 4,137,979, Cl. 177-210.00R.
Murakami, Shinichi; Akamatsu, Katsutaro; Yoshimitsu, Arata; and Noji, Sueyoshi, 4,138,279, Cl. 148-12.00E.
Uyama, Noboru; and Ozaki, Tsutomu, 4,137,978, Cl. 177-165.000.

Kugelfischer Georg Schafer & Co.: *See*—
Markfelder, Gunter; and Hofmann, Heinrich, 4,138,170, Cl. 308-195.000.

Kuhlenschmidt, Donald, to Arkla Industries, Inc. Absorption refrigeration system with precooler and inert gas control. 4,137,727, Cl. 62-490.000.

Kuhnlein, Hans L.; and Muller, Wolfgang-Dieter, to Hch. Bertrams Aktiengesellschaft; and Bayer Aktiengesellschaft. Multi-stage apparatus for concentrating sulphuric acid. 4,138,309, Cl. 159-13.00A.

Kulp, Ira L.: *See*—
Sandt, Clayton C.; and Kulp, Ira L., 4,137,588, Cl. 15-22.00R.

Kumbrant, Lars A. T. Sampling mould. 4,137,774, Cl. 73-425.40R.

Kunitz, Friedrich-Wilhelm: *See*—
Boie, Immo; Renner, Gunter; and Kunitz, Friedrich-Wilhelm, 4,138,263, Cl. 96-100.00N.
Boie, Immo; Renner, Gunter; and Kunitz, Friedrich-Wilhelm, 4,138,557, Cl. 544-183.000.

Kunkel, Heinrich; Schurger, Rainer; and Matyschik, Otto, to SKF Kugellagerfabriken GmbH. Axially supported thrust bearing. 4,138,171, Cl. 308-233.000.

Kurio, Niroyuki, to Toyo Kogyo Co., Ltd. Corner seal for rotary piston engines. 4,138,124, Cl. 277-81.00P.

Kurobe, Makoto: *See*—
Maekawa, Minoru; and Kurobe, Makoto, 4,137,622, Cl. 29-411.000.

Kurosawa, Mitsuru: *See*—
Orita, Ryuzo; and Kurosawa, Mitsuru, 4,138,558, Cl. 544-189.000.

Kurzen, Roland: *See*—
Chylewski, Christoph; Jan, Gerald; Kurzen, Roland; Meier, Max; and Schellenberg, Matthias, 4,138,256, Cl. 96-53.000.

Kusada, Rokutaro. Oil change nozzle. 4,137,998, Cl. 184-14.000.

Kuzub, Vladislav S.: *See*—
Statsenko, Nikolai N.; Kuzub, Vladislav S.; Moisa, Vladimir G.; and Kryzhny, Evgeny A., 4,138,323, Cl. 204-196.000.

Kva-Spil Ltd.: *See*—
Kvasnes, Harald, 4,137,603, Cl. 16-169.000.

Kvasnes, Harald, to Kva-Spil Ltd. Pivot assemblies of swing windows. 4,137,603, Cl. 16-169.000.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Nakamizo, Nobuhiro; Teranishi, Masayuki; Matsukuma, Ikuo; Shuto, Katsuichi; and Yamada, Koji, 4,138,485, Cl. 424-248.500.

Kyuzaki, Tsutomu: *See*—
Koyama, Kaoru; Kyuzaki, Tsutomu; and Kikuchi, Toshimoto, 4,138,625, Cl. 315-3.500.

L. Schuler GmbH: *See*—
Schneider, Franz; Waller, Eugen; Buchler, Wolfram; and Weber, Heinz, 4,138,005, Cl. 192-12.00C.

Labes, Mortimer M., to Temple University. Liquid crystal compositions. 4,138,358, Cl. 252-299.000.

Ladish, Douglas J.: *See*—
Sammak, Emil G.; Ladish, Douglas J.; Martin, John J.; and LeClaire, Claire D., 4,138,518, Cl. 428-95.000.

Lafferty, Robert M., to Agroferm AG. Microbiological methods. 4,138,291, Cl. 195-47.000.

Laflin, George P.; and Durborow, Clarence J., to Dow Chemical Company, The. Packer with chemically activated sealing member and method of use thereof. 4,137,970, Cl. 166-292.000.

Lagana, Vincenzo; and Saviano, Francesco, to Snamprogetti S.p.A. Integrated ammonia-urea producing process, for the production of urea. 4,138,434, Cl. 260-555.00A.

Laitram Corporation, The: *See*—
Lapeyre, James M., 4,138,011, Cl. 198-844.000.

Lake Geneva A & C Corporation: *See*—
Frankel, Donald P.; Kendall, Willard E.; and Cooper, John F., 4,138,331, Cl. 210-63.00R.

Lamb, Richard C.: *See*—
Iwans, Robert C.; and Lamb, Richard C., 4,137,580, Cl. 4-420.000.

Lamberts, Burton L.: *See*—
Simonson, Lloyd G.; and Lamberts, Burton L., 4,138,476, Cl. 424-50.000.

Lambros, Emanuel E. Whistling coffee pot. 4,137,832, Cl. 99-285.000.

Lamond, Trevor G.; and Wells, John L., to J. M. Huber Corporation. Process for reducing the polycyclic aromatic hydrocarbon content of carbon black. 4,138,471, Cl. 423-460.000.

Lancaster, Kenneth D., Jr.: *See*—
Payne, Larry E.; and Lancaster, Kenneth D., Jr., 4,138,033, Cl. 220-254.000.

Landolt, Paul H.; and Allen, Louis N., to American Cyanamid Company. Process for water-soluble synthetic polymer in powder form. 4,138,539, Cl. 526-93.000.

Landry, Norman R.: *See*—
Patton, Willard T.; and Landry, Norman R., 4,138,683, Cl. 343-783.000.

Lange, Karl-Heinz, to Balde Werke GmbH & Co. KG. Apparatus for retracting and extending of a lens holder of a camera. 4,137,782, Cl. 74-32.000.

Lange, Roger W.: *See*—
Mendel, Arthur; and Lange, Roger W., 4,138,336, Cl. 210-198.00C.

Langer, Konrad; and Feix, Kurt, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Strand guiding roller to be used in a continuous casting plant. 4,137,963, Cl. 164-448.000.

Lanier Business Products, Inc.: *See*—
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,138,695, Cl. 360-92.000.

Lapeyre, James M., to Laitram Corporation, The. Non-pivotal modular conveyor belt and modular links therefor. 4,138,011, Cl. 198-844.000.

Lapshinov, Georgy S.: *See*—
Kazurov, Alexandr A.; Pevzner, Leonid M.; Mikhalina, Alexandra E.; Kachkov, Nikolai P.; Lapshinov, Georgy S.; Sedov, Nikolai S.; Kainkov, Nikolai P.; and Anisimov, Stanislav M., 4,137,951, Cl. 139-68.000.

Larsson, Raymond P.; and Witonsky, Robert J., to Bio-Medical Sciences, Inc. Device for monitoring ethylene oxide sterilization process. 4,138,216, Cl. 422-56.000.

La Tour, Barry. Ski dressing apparatus. 4,137,673, Cl. 51-139.000.

Latta, Joseph E., Jr.; and Stafford, Virgil M., to Latta, said Joseph E., Jr., by said Virgil M. Stafford. School bus stop sign. 4,138,668, Cl. 340-130.000.

Latta, said Joseph E., Jr.: *See*—
Latta, Joseph E., Jr.; and Stafford, Virgil M. (said Virgil M. Stafford assors. to), 4,138,668, Cl. 340-130.000.

Lattin, Michael E. Planting apparatus including spring for vibration of pickup spokes. 4,137,854, Cl. 111-77.000.

Lauper, Warner R., to Quadrastat Controls Corporation. Illuminated position indicator for a control shift lever. 4,137,864, Cl. 116-28.100.

Lauri, Angelo. Means for inspecting an annular workpiece. 4,137,641, Cl. 33-178.00E.

Lawes, Michael J. A. Loose leaf binders. 4,138,143, Cl. 281-47.000.

Lawrence, Anthony J., to Tungum Company Limited, The. Pipe couplings. 4,138,145, Cl. 285-23.000.

Lawrence, James P.: *See*—
Gardner, James D.; and Lawrence, James P., 4,137,894, Cl. 152-330.0RF.

Lebanon Steel Foundry: *See*—
Vogel, Edward G.; and Westlund, Rodney C., 4,138,268, Cl. 106-84.000.

Lechler, Edwin F.: *See*—
Lechler, Friedrich W.; Lechler, Edwin F.; and Lechler, Herbert A., 4,138,134, Cl. 280-411.00A.

Lechler, Friedrich W.; Lechler, Edwin F.; and Lechler, Herbert A. Folding harrow frame. 4,138,134, Cl. 280-411.00A.

Lechler, Herbert A.: *See*—
Lechler, Friedrich W.; Lechler, Edwin F.; and Lechler, Herbert A., 4,138,134, Cl. 280-411.00A.

LeClaire, Claire D.: *See*—
Sammak, Emil G.; Ladish, Douglas J.; Martin, John J.; and LeClaire, Claire D., 4,138,518, Cl. 428-95.000.

Lee, Arthur L.; and Coval, Arthur B., to A. L. Lee Corporation. Brake mechanism. 4,138,001, Cl. 188-170.000.

Leeds and Micallef: *See*—
Micallef, Lewis A., 4,138,039, Cl. 222-321.000.

Lees, William A.: *See*—
Baldwin, Terence R.; Bennett, David J.; and Lees, William A., 4,138,449, Cl. 260-879.000.

LeFevre, Cecil W.: *See*—
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,138,244, Cl. 71-121.000.

Lehureau, Jean-Claude; and Oprandi, Pierre, to Thomson-Brandt. Optical reader for information discs equipped with means for automatic access to the information. 4,138,663, Cl. 340-146.30F.

Leininger, Robert I.; Preston, Joseph R.; and Lower, Brenton R., to Ortho Pharmaceutical Corp. Dilator for cervical canal. 4,137,922, Cl. 128-344.000.

Lelane Standard Junior University, Board of Trustees of The: *See*—
Boyd, Douglas P., 4,138,721, Cl. 364-414.000.

LeMay, Christopher A. G., to Emi Limited. Ultrasonic apparatus. 4,137,775, Cl. 73-602.000.

Lemmon, James A. Motorized tinsel decorating tool. 4,138,048, Cl. 226-152.000.

Lenahan, Dean T.: *See*—
Andersen, Richard H.; Corsmeier, Robert J.; Rauf, James P.; and Lenahan, Dean T., 4,137,705, Cl. 60-39.080.

Leonard, Willie B. Fluidic repeater. 4,137,825, Cl. 91-388.000.

Leppert, Thomas K.: *See*—
Mullins, Keith M.; Leppert, Thomas K.; Cannon, Thomas; Kerr, Ronald R.; and Smith, Ronn G., 4,138,066, Cl. 241-86.000.

Leroy, Pierre, to Creusot-Loire. Method of blowing smelting shaft furnaces and tuyeres used for said blowing. 4,138,098, Cl. 266-268.000.

Les Produits Associes LPA S.A.: *See*—
Jousson, Pierre J., 4,137,911, Cl. 128-66.000.
Moret, Michel, 4,138,064, Cl. 239-582.000.

Leszlauer, Zoltan, to Licencia Talalmanyokat Ertekesito Vallalat. Production of capacitor elements having especially high specific energy content. 4,138,712, Cl. 361-433.000.

Leuenberger, Hans G. W.: *See*—
Barner, Richard; Boguth, Walter; Leuenberger, Hans G. W.; Schmid, Max; and Zell, Reinhard, 4,138,289, Cl. 195-30.000.

Lever Brothers Company: *See*—
Evans, William P.; and Naik, Appayya R., 4,138,435, Cl. 260-567.60M.
van Rij, Johannes D.; and Smits, Johannes W., 4,137,605, Cl. 17-46.000.

Levine, Robert A.: *See*—
Wardlaw, Stephen C.; Levine, Robert A.; and Massey, James V., III, 4,137,755, Cl. 73-61.10R.

Levy, Giorgio. System for metering and film packaging of bitumen and like materials. 4,137,692, Cl. 53-440.000.

Lewin, John E., to Shiley Scientific Incorporated. Method and apparatus for oxygenating and regulating the temperature of blood. 4,138,288, Cl. 195-1.800.

Lewin, John E. Blood oxygenator with integral heat exchanger. 4,138,464, Cl. 422-46.000.

Leyerzapf, Manfred: *See*—
Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, 4,138,593, Cl. 179-1.00E.

Leypold, Dieter; and Schucht, Peter, to Siemens Aktiengesellschaft. Circuit for synchronizing the oscillation of a pulsed oscillator with a reference oscillation. 4,138,679, Cl. 343-100.0SA.

Libbey-Owens-Ford Company: *See*—
Eggert, John N.; Herrington, Richard A.; and Oelke, Waldemar W., 4,138,237, Cl. 65-104.000.

Liberman, Arnold J., to Zenith Radio Corporation. Voltage regulating transformer having EI laminations and two center legs of different reluctance. 4,138,636, Cl. 323-45.000.

Licencia Talalmanyokat Ertekesito Vallalat: *See*—
Leszlauer, Zoltan, 4,138,712, Cl. 361-433.000.

Licentia Patent-Verwaltungs GmbH: *See*—
Srowig, Reinhard, 4,138,624, Cl. 313-417.000.

Lieske, Edgar: *See*—
Reese, Gunter; Weinrich, Erwin; and Lieske, Edgar, 4,138,478, Cl. 424-62.000.

Lifetime Foam Products, Inc.: *See*—
Tedesco, Francis A., 4,138,534, Cl. 521-79.000.

Lindblad, Stig M. Latch mechanism for safety belts. 4,137,611, Cl. 24-230.0AL.

Linde AG: *See*—
Abels, Theodor, 4,137,990, Cl. 180-155.000.
Forster, Franz, 4,137,717, Cl. 60-487.000.

Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, tc Bayer Aktiengesellschaft. Crosslinkable acrylonitrile copolymers. 4,138,393, Cl. 526-287.000.

Lindquist, J. Theodore. Safety guard for power presses. 4,137,795, Cl. 74-613.000.

Lindsley, Warren F. B.: *See*—
Mineck, Fred, 4,137,878, Cl. 123-119.00B.

Linko, Peter J., III; and Harrier, Stanley C., to General Electric Company. Method of making a fire retardant conduit. 4,137,949, Cl. 138-125.000.

Lipinski, Richard J., to Mogul Corporation, The. Corrosion inhibiting composition and process of using same. 4,138,353, Cl. 252-181.000.

Liqui-Box Corporation: *See*—
Bond, Curtis J., 4,138,036, Cl. 222-105.000.

Litton Systems, Inc.: *See*—
McAdams, Hugh P., Jr.; and Balog, Ronald J., 4,138,661, Cl. 340-27.0AT.

Lockwood Corporation: *See*—
Doll, Joseph D., 4,138,705, Cl. 361-42.000.

Loepfe, Erich: *See*—
Stahlecker, Fritz; and Loepfe, Erich, 4,137,699, Cl. 57-264.000.

Loewy Robertson Engineering Co., Ltd.: *See*—
Ross, Hugh McD.; and Simmonds, Edwin, 4,138,074, Cl. 242-78.100.

Loflin, Max G. Fuel vaporizing device for internal combustion engines. 4,137,872, Cl. 123-34.00A.

Logan, Robert E. A. Method and apparatus for transmitting liquid suphur over long distances. 4,137,938, Cl. 137-340.000.

Logmans, Hans: *See*—
Breed, Dirk J.; Voermans, Antonius B.; and Logmans, Hans, 4,138,530, Cl. 428-539.000.

Lohmeyer, Kurt W., to Tru-Spoke, Inc. Simulated knock off spinner nut and adapter. 4,138,160, Cl. 301-108.00S.

Lohr, Raymond J. Moving target game with impact device. 4,138,112, Cl. 273-101.200.

Lohse, Rudolf K.: *See*—
Bauml, Kurt; Gunsser, Otto C.; and Lohse, Rudolf K., 4,137,823, Cl. 90-64.000.

Loncaric, Rado G., to Atlantic Richfield Company. Anti-electrostatic sampling method. 4,137,773, Cl. 73-421.00B.

Long, Everett J.; and Muench, Elmer W., to Everett/Charles, Inc. Test apparatus. 4,138,186, Cl. 339-117.00P.

Longworth, Alfred, to T. I. Domestic Appliances Limited. Gaseous fuel burners. 4,137,905, Cl. 126-350.00R.

Loomis, Jester M., III, to United States of America, Army. Launch tube antenna. 4,137,819, Cl. 89-1.813.

Loomis, Phillip E.: *See*—
Davis, Newton G.; Hammond, James W.; and Loomis, Phillip E., 4,137,624, Cl. 29-566.100.

Loranger, Florene K. Unitary structure tatting shuttle. 4,137,818, Cl. 87-58.000.

L'Oreal: *See*—
Vanlerberghe, Guy; and Sebag, Henri, 4,138,427, Cl. 260-459.00A.

Lower, Brenton R.: *See*—
Leininger, Robert I.; Preston, Joseph R.; and Lower, Brenton R., 4,137,922, Cl. 128-344.000.

Lucas, William J. Piston ring with expansive force responsive to pressure. 4,138,125, Cl. 277-170.000.

Luhowy, Gabriel J., to Harris Corporation. Digitally tuned circuit including switching of bank capacitors between plural tuned circuits. 4,138,654, Cl. 334-55.000.

Lukac, Frederick S.; and Zbryski, William P., to Allegheny Ludlum Industries, Inc. Method for cleaning strip. 4,138,273, Cl. 134-10.000.

Luke, George M.: *See*—
Crenshaw, Ronnie R.; Luke, George M.; and Partyka, Richard A., 4,138,561, Cl. 544-284.000.

Lurie, Evgeny V.: *See*—
Buls, Yanis I.; Gailis, Gunar E.; Borovikova, Sofia M.; Lurie, Evgeny V.; and Mikhailov, Valery F., 4,138,065, Cl. 241-55.000.

Luther, Arch C.: *See*—
Hedlund, Lee V.; and Luther, Arch C., 4,138,741, Cl. 365-234.000.

Lutze, Siegfried; Schneller, Peter; Birnkraut, Hans-Walter; Berzen, Josef; and Hetkamp, Gunter, to Ruhrchemie Aktiengesellschaft. Process for the manufacture of high molecular copolymerisates of ethylene. 4,138,540, Cl. 526-159.000.

M. Myers & Son Limited: *See*—
Rabley, Derek S., 4,138,015, Cl. 206-561.000.

M&T Chemicals Inc.: *See*—
Arcilesi, Donald A., 4,138,294, Cl. 204-55.00R.
Gitlitz, Melvin H.; Engelhart, John E.; and Mery, Carlos M., 4,138,483, Cl. 424-245.000.

Macawber Engineering Limited: *See*—
Snowdon, Brian, 4,137,935, Cl. 137-242.000.

Mack, Anthony C.; and Shumrak, George K., to Sweetheart Plastics, Inc. Food service method. 4,138,504, Cl. 426-520.000.

Mackie, Gordon, to James Mackie & Sons Limited. Yarn winder. 4,138,070, Cl. 242-18.00A.

MacLean, John P.: *See*—
Colvert, James H.; MacLean, John P.; Williams, Dale; and Jones, Henry B., 4,138,219, Cl. 422-144.000.

MADAG Maschinen - und Apparatebau Dietikon AG: *See*—
Engler, Peter; and Heller, Georg, 4,137,729, Cl. 66-75.100.

Madsen, Hans B.: *See*—
Klemmensen, Per D.; Kolind-Andersen, Hans; and Madsen, Hans B., 4,138,584, Cl. 560-124.000.

Maekawa, Minoru; and Kurobe, Makoto, to Sekisui Jushi Kabushiki Kaisha. Method of preparing a support. 4,137,622, Cl. 29-411.000.

Maekawa, Yoshihiro; and Matsuura, Masatoshi, to Orient Chemical Industries, Ltd. Method for removing tar from crude tolylene diisocyanate. 4,138,424, Cl. 260-453.0SP.

Maekawa, Yousuke: *See*—
Ueda, Shigeru; Makino, Kazuo; Nakata, Yoshinori; Hasegawa, Yoshihisa; Yokoyama, Shinichi; Yoshida, Ryoichi; Maekawa, Yousuke; and Yoshida, Yuji, 4,138,035, Cl. 222-1.000.

Maeyama, Koichiro: *See*—
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makoto; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,138,714, Cl. 362-231.000.

Magerlein, Barney J., to Upjohn Company, The. Cis-4,5-didehydro-16-phenoxy-PGA$_1$ compounds. 4,138,574, Cl. 560-53.000.

Magnenet, Jean G., to Compagnie Honeywell Bull. Head arrangement for perpendicular recording information on a magnetic record carrier. 4,138,702, Cl. 360-125.000.

Magnetronic Gesellschaft fur elektronischmechanische Gerate mbH & Co., Entwicklungs-KG: *See*—
Herleth, Karl, 4,137,789, Cl. 74-404.000.

Mahoney, William P., to Ball Corporation. Band tightness indicator. 4,138,029, Cl. 215-230.000.

Maier, Henry B. Solar energy collecting and trapping apparatus for home heating or cooling. 4,137,901, Cl. 126-271.000.

Makhmudov, Takhir M.: *See*—
Khodzhakhanov, Nabi A.; Makhmudov, Takhir M.; and Akhmedov, Karim S., 4,138,425, Cl. 260-458.00C.

Makino, Kazuo: *See*—
Ueda, Shigeru; Makino, Kazuo; Nakata, Yoshinori; Hasegawa, Yoshihisa; Yokoyama, Shinichi; Yoshida, Ryoichi; Maekawa, Yousuke; and Yoshida, Yuji, 4,138,035, Cl. 222-1.000.

Malek, Wasfi N., to Beiersdorf Aktiengesellschaft. Sheet or web type materials with a markable adhesive-repellent coating, and a process for their manufacture. 4,138,527, Cl. 428-425.000.

Mallinckrodt, Inc.: *See*—
Wiegert, Philip E., 4,138,589, Cl. 562-434.000.

Malloy, John D., to General Motors Corporation. Vibration damper for a torque converter lock-up clutch. 4,138,003, Cl. 192-3.290.

Manchester, Luther L.; and Reneau, Bobby J. Coupling device. 4,138,147, Cl. 285-165.000.

Maniscalco, Joseph P.: *See*—
Ries, Donald G.; and Maniscalco, Joseph P., 4,138,431, Cl. 260-502.40P.

Manly, John P.: *See*—
Davies, Ronald F.; and Manly, John P., 4,138,220, Cl. 422-173.000.

Mantz, Arlan W., to Block Engineering, Inc. System for analyzing time-dependent phenomena. 4,138,727, Cl. 364-525.000.

Maples, Crill: *See*—
Ulrich, Richard D.; Maples, Crill; and Schafer, Howard C., 4,137,966, Cl. 165-30.000.

Marathon Oil Company: *See*—
Phalangas, Charalambos J.; Restaino, Alfred J.; and Yun, HanBo, 4,137,969, Cl. 166-274.000.

Markfelder, Gunter; and Hofmann, Heinrich, to Kugelfischer Georg Schafer & Co. Cageless ball or roller bearing. 4,138,170, Cl. 308-195.000.

Markhof, Horst: *See*—
Harmsen, Nils; Markhof, Horst; Reichelt, Walter; Schiff, Klaus-Ludwig; and Thiede, Horst, 4,138,604, Cl. 200-267.000.

Marold, Ulrich, to Theodor Kromer KG Spezialfabrik fur Sicherheitsschlosser. Time lock with automatic reset. 4,137,738, Cl. 70-274.000.

Marrs, Oren L.; Reusser, Robert E.; and Tieszen, Dale O., to Phillips Petroleum Company. Pipe coating composition. 4,138,516, Cl. 428-36.000.

Martel, Bernard G. M.; Wallerand, Philippe G. S.; and Eygret, Daniel L., to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Fuel supply device for internal combustion engine. 4,137,871, Cl. 123-32.0EG.

Martens, Peter: *See*—
Schultz, Neithart; Vahlensieck, Hans-Joachim; and Martens, Peter, 4,138,439, Cl. 260-653.600.

Martin, John H. E. J.; and Hertz, Martin R., to American Cyanamid Company. Antibiotic BL580Δ and method of use. 4,138,481, Cl. 424-181.000.

Martin, John J.: *See*—
Sammak, Emil G.; Ladish, Douglas J.; Martin, John J.; and Le-Claire, Claire D., 4,138,518, Cl. 428-95.000.

Martin Marietta Corporation: *See*—
Miller, Edward J., 4,138,715, Cl. 363-28.000.

Martin, Robert L., to Fedders Corporation. Compressor control for a reversible heat pump. 4,137,725, Cl. 62-160.000.

Marton, Fred S.: *See*—
Edison, David M.; Marton, Fred S.; and Ucovich, John N., 4,138,669, Cl. 340-147.00R.

Marvin Glass & Associates: *See*—
Jaworski, Eugene, 4,137,892, Cl. 124-10.000.

Masclet, Jean, to Messer-Hispano. Apparatus for adjusting braking forces on vehicle wheels as a function of deceleration and acceleration of the braked wheels. 4,138,164, Cl. 303-105.000.

Maskwa, Alvin: *See*—
Kaminsky, Victor; Trevoy, Lloyd W.; and Maskwa, Alvin, 4,138,467, Cl. 423-74.000.

Massachusetts Institute of Technology: *See*—
Buckley, Bruce S., 4,137,964, Cl. 165-1.000.

Massey-Ferguson Services N.V.: *See*—
Ceccano, Lidano, 4,137,792, Cl. 74-473.00R.

Massey, James V., III: *See*—
Wardlaw, Stephen C.; Levine, Robert A.; and Massey, James V., III, 4,137,755, Cl. 73-61.10R.

Masson, Pierre L.; and Heremans, Joseph, deceased (by Heremans, Marie-Therese Bracke, legal representative), to Technicon Instruments Corporation. Agglutination immunoassay of immune complex with RF or Clq. 4,138,213, Cl. 23-230.00B.

Masuda, Senichi. Pulse-charging type electric dust collecting apparatus. 4,138,233, Cl. 55-139.000.

Masui, Hiroaki: *See*—
Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; and Mazuda, Hiroo, 4,138,278, Cl. 148-12.00R.

Masunaga, Katsuro: *See*—
Umemura, Sumio; Matsui, Kanenobu; Ikeda, Yoshinari; and Masunaga, Katsuro, 4,138,580, Cl. 560-81.000.

Matono, Hirokuni, to Glory Kogyo Kabushiki Kaisha. Coin stacking tube device. 4,137,927, Cl. 133-1.00A.

Matsuda, Shimpei: *See*—
Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; Watanabe, Yoshihisa; Imanari, Makoto; and Nakajima, Fumito, 4,138,469, Cl. 423-239.000.

Matsui, Hisashi: *See*—
Arakawa, Masatoshi; Ohno, Ryotaro; Ishikawa, Katuhiro; Yamahara, Noboru; and Matsui, Hisashi, 4,138,419, Cl. 260-429.00R.

Matsui, Kanenobu: *See*—
Umemura, Sumio; Matsui, Kanenobu; Ikeda, Yoshinari; and Masunaga, Katsuro, 4,138,580, Cl. 560-81.000.

Matsukuma, Ikuo: *See*—
Nakamizo, Nobuhiro; Teranishi, Masayuki; Matsukuma, Ikuo; Shuto, Katsuichi; and Yamada, Koji, 4,138,485, Cl. 424-248.500.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kokei, Akira, 4,138,698, Cl. 360-74.000.
Matsushita, Shigetada, to Fuji Electric Co., Ltd. Electromagnetic fluid flowmeter insensitive to flow velocity distribution. 4,137,765, Cl. 73-194.0EM.
Matsuura, Masatoshi: *See*—
Maekawa, Yoshihiro; and Matsuura, Masatoshi, 4,138,424, Cl. 260-453.0SP.
Mattel, Inc.: *See*—
Kimmell, Steven D.; and Stansbury, Benjamin H., Jr., 4,138,127, Cl. 280-11.230.
Mattes, Lothar, to Fischer, Georg. Tooth structure for burr-free cutting saw blade. 4,137,808, Cl. 83-851.000.
Matyschik, Otto: *See*—
Kunkel, Heinrich; Schurger, Rainer; and Matyschik, Otto, 4,138,171, Cl. 308-233.000.
Maurer, Barbara V.: *See*—
Haugwitz, Rudiger D.; Cruthers, Larry R.; and Maurer, Barbara V., 4,138,493, Cl. 424-273.00B.
Maxfield, Don A. Toilet bowl cleaning device. 4,137,577, Cl. 4-231.000.
Maxwell, Jerrold F.: *See*—
Nassry, Assadullah; and Maxwell, Jerrold F., 4,138,346, Cl. 252-32.500.
Mazuda, Hiroo: *See*—
Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; and Mazuda, Hiroo, 4,138,278, Cl. 148-12.00R.
Mazzae, John F.: *See*—
Capehart, Jack D.; Mazzae, John F.; and McGrew, David R., 4,138,592, Cl. 178-19.000.
McAdams, Hugh P., Jr.; and Balog, Ronald J., to Litton Systems, Inc. Attitude indicator having expanded scale. 4,138,661, Cl. 340-27.0AT.
McAdams, Timothy E.: *See*—
Bremenour, Edwin L.; McAdams, Timothy E.; and Rhodes, Clifford A., 4,138,711, Cl. 361-424.000.
McAinsh, James; and Rowe, Raymond C., to Imperial Chemical Industries Limited. Sustained release pharmaceutical composition. 4,138,475, Cl. 424-19.000.
McAlarney, Fred R., to Pantasote Company, The. Dual function sealing gasket. 4,138,049, Cl. 277-80.000.
McCabe, John S., to Chicago Bridge & Iron Company. Full secondary seal, wiper type, for a floating roof tank. 4,138,032, Cl. 220-224.000.
McCann, David H., to Westinghouse Electric Corp. Non-volatile memory with improved readout. 4,138,737, Cl. 365-78.000.
McCarthy, Charles J., to United States of America, Health, Education and Welfare. Slide valve. 4,138,089, Cl. 251-61.000.
McCarthy, Robert F., to Procter & Gamble Company, The. Package for discrete pre-moistened interleaved sheets and the pop-up dispensing thereof. 4,138,034, Cl. 221-48.000.
McClain, D. Wayne: *See*—
Miller, Barry E.; McClain, D. Wayne; and McCrory, William W., Jr., 4,138,178, Cl. 339-15.000.
McClure, Clifton M., III. High pressure oxygen compressor. 4,138,218, Cl. 422-120.000.
McCluskey, Stanley A.: *See*—
Boyd, Jerry L., 4,137,830, Cl. 93-55.000.
McClusky, Stanley A.; and Boyd, Jerry L., to McClusky, Stanley A. Bag filling and weighing machine. 4,137,689, Cl. 53-502.000.
McClusky, Stanley A. Transfer means for a pliant bag having contents therein. 4,137,855, Cl. 112-11.000.
McCormick, J. Byron; Depp, Steven W.; Hamilton, Douglas J.; and Kerwin, William J., to United States of America, Energy. High temperature electronic gain device. 4,138,622, Cl. 313-306.000.
McCrory, William W., Jr.: *See*—
Miller, Barry E.; McClain, D. Wayne; and McCrory, William W., Jr., 4,138,178, Cl. 339-15.000.
McGee, John K., to Combustion Engineering, Inc. Drive nut and torque plate assembly. 4,138,091, Cl. 251-267.000.
McGill, Lee E.: *See*—
Hunger, Darrell M.; McGill, Lee E.; and von Alven, Raymond D., 4,138,105, Cl. 272-99.000.
McGrew, David R.: *See*—
Capehart, Jack D.; Mazzae, John F.; and McGrew, David R., 4,138,592, Cl. 178-19.000.
McKelvey, Harold E., to Shatterproof Glass Corporation. Apparatus for tempering glass sheets. 4,138,241, Cl. 65-351.000.
McKenzie, Bruce A., to Purdue Research Foundation. Ducted material handling device for top unloading of a storage receptacle. 4,138,021, Cl. 214-17.00C.
McKeon, James J. Sliding cover for a truck. 4,138,154, Cl. 296-98.000.
McKinlay, James R., to United States of America, Navy. Presettable integrating timing circuit. 4,138,615, Cl. 307-293.000.
McKinney, David E.; and Phillips, Donald E. Wiener stick applicator. 4,138,050, Cl. 227-117.000.
McKinney, Joel D.: *See*—
Beuther, Harold; McKinney, Joel D.; and Swift, Harold E., 4,138,325, Cl. 208-50.000.
McLaughlin, Patricia A.: *See*—
Stapleton, Earl W.; McLaughlin, Patricia A.; and Turnbaugh, Jerry E., 4,138,605, Cl. 219-216.000.
McLaughlin, William A.; and Berkshire, David C., to Shell Oil Company. Acidizing reservoirs while chelating iron with sulfosalicylic acid. 4,137,972, Cl. 166-307.000.
McMillan, John E., to General Electric Company. Lamp leads. 4,138,623, Cl. 313-331.000.
McMullen, William H.; and Carasik, William, to Novo Laboratories, Incorporated. Glucose isomerization under expanded bed conditions. 4,138,290, Cl. 195-31.00F.
Mead Corporation, The: *See*—
Cha, Charles L.; and Hou, Shou L., 4,138,687, Cl. 346-75.000.
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., 4,138,508, Cl. 427-54.000.
Mecafina S.A.: *See*—
Rimmele, Karl, 4,138,334, Cl. 210-159.000.
Mechanical Service Co., Inc.: *See*—
Hudimac, George S., 4,138,603, Cl. 200-153.00T.
Med General, Inc.: *See*—
Miller, Curtis H.; and Arp, Robert A., 4,138,179, Cl. 339-17.0LC.
Medina, Sergio P. Auxiliary air inlet device for internal combustion engines. 4,137,875, Cl. 123-119.00D.
Mediscan Inc.: *See*—
Haverl, Ronald A.; and Stoller, Milton, 4,137,777, Cl. 73-620.000.
Meeker, Robert G.; Scanlon, William J.; and Segal, Zvi, to International Business Machines Corporation. Gas encapsulated cooling module. 4,138,692, Cl. 357-82.000.
Megard, Pierre, to Etablissements Chalon-Megard (Societe Anonyme). Apparatus for the production of cheese. 4,137,836, Cl. 99-454.000.
Mehta, Harshavardhan C.: *See*—
Fang, Hsai-Yang; and Mehta, Harshavardhan C., 4,137,685, Cl. 52-727.000.
Meier, Max: *See*—
Chylewski, Christoph; Jan, Gerald; Kurzen, Roland; Meier, Max; and Schellenberg, Matthias, 4,138,256, Cl. 96-53.000.
Meiji Seika Kaisha, Ltd.: *See*—
Eida, Toshiaki; Saito, Yasuhiro; Saito, Tomiji; Yomoto, Chobe; and Nakajima, Yutaka, 4,138,506, Cl. 426-598.000.
Meinzer, Lester N. Guard rail cell. 4,138,093, Cl. 256-13.100.
Melcher, Robert L.; and von Gutfeld, Robert J., to International Business Machines Corporation. Clamped acoustic elastic wave generator. 4,137,991, Cl. 181-142.000.
Melkersson, Karl-Axel: *See*—
Hedenas, Bo G. V.; Wiklund, Johan E.; Johansson, Thore R. H.; and Melkersson, Karl-Axel, 4,138,231, Cl. 55-71.000.
Mellon, A. Darline: *See*—
Okuzumi, Yuzi; Mellon, A. Darline; and Wasserman, David, 4,137,921, Cl. 128-335.500.
Melnor Industries: *See*—
Chow, Ho, 4,137,939, Cl. 137-355.270.
Mendel, Arthur; and Lange, Roger W., to Minnesota Mining and Manufacturing Company. Thin layer chromatographic plates. 4,138,336, Cl. 210-198.00C.
Merchant, Howard D.: *See*—
Platt, Clark I.; and Merchant, Howard D., 4,137,736, Cl. 68-134.000.
Merkle, Hans: *See*—
Sander, Bruno; Mueller, Albrecht; Merkle, Hans; and Janisch, Gerhard, 4,138,269, Cl. 106-90.000.
Mery, Carlos M.: *See*—
Gitlitz, Melvin H.; Engelhart, John E.; and Mery, Carlos M., 4,138,483, Cl. 424-245.000.
Messer-Hispano: *See*—
Masclet, Jean, 4,138,164, Cl. 303-105.000.
Messier, Dennis G.: *See*—
Wenghoefer, Johann; and Messier, Dennis G., 4,138,395, Cl. 260-149.000.
Metcalfe, Robert A.: *See*—
Boucher, Raymond R.; and Metcalfe, Robert A., 4,138,096, Cl. 266-240.000.
Metters, Champa H.: *See*—
Barnes, David; and Metters, Champa H., 4,138,322, Cl. 204-195.00H.
Metzeler Kautschuk AG: *See*—
Rost, Harry, 4,138,307, Cl. 156-415.000.
Meussdoerffer, Johann N.; Bockelmann, Wolfgang; and Niederprum, Hans, to Bayer Aktiengesellschaft. Producing chromate substantially free of vanadium. 4,138,466, Cl. 423-61.000.
Meyer, Gunther: *See*—
Janssen, Paul, deceased; Meyer, Gunther; Thewalt, Klaus; and Schmidt, Reinhard, 4,138,544, Cl. 528-272.000.
Meyer, Lewis M., to Diamond Shamrock Corporation. Metal laminate strip construction of bipolar electrode backplates. 4,138,324, Cl. 204-284.000.
Micallef, Lewis A., to Leeds and Micallef. Pump actuating system. 4,138,039, Cl. 222-321.000.
Michael, Vesta F., to Fiber Glass Systems, Inc. Filament rod construction and method of forming the same. 4,138,285, Cl. 156-161.000.
Michel, Wolfgang: *See*—
Bayer, Karl-Heinz; Blaschke, Felix; Neuffer, Ingemar; and Michel, Wolfgang, 4,138,729, Cl. 364-603.000.
Micheron, Francois: *See*—
Huignard, Jean-Pierre; Herriau, Jean-Pierre; and Micheron, Francois, 4,138,189, Cl. 350-3.640.
Michigan Pipe Fittings Company: *See*—
Rumble, Edgar B., 4,138,146, Cl. 285-39.000.
Micro Circuits Company: *See*—
Bradley, Robert F., 4,138,106, Cl. 272-129.000.
Middelbeek, Cornelis G.; Wolters, Tjako A.; and Den Boer, Jan B., to Ballast-Nedam Groep N.V.; and Skimovex B.V. Device for separat-

ing water from substances contained therein. 4,138,342, Cl. 210-522.000.

Midgley, Edward L., to Stamcomp, Inc. Solid state tuner control. 4,138,653, Cl. 334-15.000.

Mih, Li C.: *See*—
Wilson, Raymond F.; Peck, Reese A.; Herbstman, Sheldon; and Mih, Li C., 4,138,227, Cl. 44-62.000.

Mihara, Yuji: *See*—
Hinata, Masanao; Mihara, Yuji; Shishido, Tadao; and Adachi, Keiichi, 4,138,266, Cl. 96-123.000.

Mikhailov, Valery F.: *See*—
Buls, Yanis I.; Gailis, Gunar E.; Borovikova, Sofia M.; Lurie, Evgeny V.; and Mikhailov, Valery F., 4,138,065, Cl. 241-55.000.

Mikhalina, Alexandra E.: *See*—
Kazurov, Alexandr A.; Pevzner, Leonid M.; Mikhalina, Alexandra E.; Kachkov, Nikolai P.; Lapshinov, Georgy S.; Sedov, Nikolai S.; Kainkov, Nikolai P.; and Anisimov, Stanislav M., 4,137,951, Cl. 139-68.000.

Miles Laboratories, Inc.: *See*—
Woessner, Warren D.; Biddlecom, William G.; Arndt, Henry C.; Peruzzotti, George P.; and Sih, Charles J., 4,138,582, Cl. 560-118.000.
Woessner, Warren D.; Biddlecom, William G.; Arndt, Henry C.; Peruzzotti, George P.; and Sih, Charles J., 4,138,583, Cl. 560-118.000.

Milewski, Andrzej T.: *See*—
Godard, Dominique N.; and Milewski, Andrzej T., 4,138,644, Cl. 325-320.000.

Miller, Barry E.; McClain, D. Wayne; and McCrory, William W., Jr., to United States of America, Navy. Diver's composite umbilical. 4,138,178, Cl. 339-15.000.

Miller, Curtis H.; and Arp, Robert A., to Med General, Inc. Coaxial jack for printed circuit boards. 4,138,179, Cl. 339-17.0LC.

Miller, Donald, to United States of America, Army. Tilting table initial tack test apparatus for adhesive bonds. 4,137,761, Cl. 73-150.00A.

Miller, Edward J., to Martin Marietta Corporation. Resonant switching converter. 4,138,715, Cl. 363-28.000.

Miller, Henry L., to Miller Screen & Design, Inc. Method and apparatus for applying decorative imprints to the surfaces of plastic workpieces. 4,137,842, Cl. 101-128.300.

Miller, Robert A.; and Davis, Geoffrey E., to Plessey Handel und Investments AG. A field compensated motor/generator. 4,138,629, Cl. 318-140.000.

Miller, Russell C., to J. M. Eltzroth & Associates, Inc. Coating compositions. 4,138,276, Cl. 148-6.200.

Miller Screen & Design, Inc.: *See*—
Miller, Henry L., 4,137,842, Cl. 101-128.300.

Miller, William C. Storm window latch mechanism. 4,137,671, Cl. 49-417.000.

Miller, William H.: *See*—
Hacker, John R.; Krohne, Chris W.; and Miller, William H., 4,138,181, Cl. 339-45.00R.

Millet, Claude: *See*—
Bargain, Michel; and Millet, Claude, 4,138,543, Cl. 528-14.000.

Milliken Research Corporation: *See*—
Brown, Robert S., 4,137,590, Cl. 15-50.00R.
Eschenbach, Paul W., 4,137,601, Cl. 15-380.000.

Mills, Albert T., Jr.: *See*—
VanAuken, Richard; and Mills, Albert T., Jr., 4,138,301, Cl. 156-189.000.

Minami, Satoyuki: *See*—
Motegi, Masahiko; Fujita, Saburo; Okabe, Kazuo; Miura, Yasuki; and Minami, Satoyuki, 4,138,386, Cl. 260-40.00R.

Minatoya, Hiroaki; Tullar, Benjamin F.; and Conway, Walter D., to Sterling Drugs Inc. 3(Hydroxy or hydroxymethyl)-4(hydroxy)-α-(aminomethyl)benzyl alcohols. 4,138,581, Cl. 560-109.000.

Minchak, Robert J., to B. F. Goodrich Company, The. Process for preparing polymers of cyclopentadiene and bicycloheptene mixtures. 4,138,448, Cl. 260-879.000.

Mine, Junichi; Iizuka, Akio; Yoneshige, Tetsuhiko; and Ito, Hidefumi, to Nissan Motor Company, Limited. Method of producing catalyst for conversion of carbon monoxide and hydrocarbons in engine exhaust gas. 4,138,367, Cl. 252-466.0PT.

Mineck, Fred, to Archer, Dorothy J.; Mineck, Jay A.; and Lindsley, Warren F. B., part interest to each. Supplementary carburetor. 4,137,878, Cl. 123-119.00B.

Mineck, Jay A.: *See*—
Mineck, Fred, 4,137,878, Cl. 123-119.00B.

Minnesota Mining and Manufacturing Company: *See*—
Dickson, Arthur D., 4,138,620, Cl. 313-1.000.
Goralski, Edwin A., 4,137,670, Cl. 51-392.000.
Kampfer, Robert D.; and Dierssen, Gunther H., 4,138,211, Cl. 431-35.000.
Mendel, Arthur; and Lange, Roger W., 4,138,336, Cl. 210-198.00C.

Minton, Darrell B., to National Controls, Inc. Key actuator. 4,138,197, Cl. 400-474.000.

Mitchell, Philip B., to Standard Oil Company (Indiana). Conductive secondary backings and tufted carpets made therewith. 4,138,519, Cl. 428-95.000.

Mitchell, William D.; Adams, John O.; and Simmons, John J., to Olin Corporation. Leak-testing method for diaphragm-type electrolytic cells. 4,137,752, Cl. 73-45.500.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makoto; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,138,714, Cl. 362-231.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; Watanabe, Yoshihisa; Imanari, Makoto; and Nakajima, Fumio, 4,138,469, Cl. 423-239.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Sato, Hiroshi; Nakatani, Munetsugu; Nakatsui, Hiroshi; Kakita, Hideto; Shimoyama, Hiroyuki; Mochida, Naoki; and Sugimori, Shuichi, 4,138,520, Cl. 428-141.000.

Mitzlaff, Michael, to Hoechst Aktiengesellschaft. Omega-alkoxy derivatives of lactams. 4,138,400, Cl. 260-239.30R.

Mitzlaff, Michael, to Hoechst Aktiengesellschaft. ω-Alkoxy derivatives of lactams and process for their manufacture. 4,138,408, Cl. 260-326.450.

Mitzlaff, Michael: *See*—
Warning, Klaus; and Mitzlaff, Michael, 4,138,418, Cl. 260-410.90R.

Miura, Norio: *See*—
Mori, Etsuo; Shimiya, Keiji; Miura, Norio; and Suzuki, Yujiro, 4,138,529, Cl. 428-539.000.

Miura, Yasuki: *See*—
Motegi, Masahiko; Fujita, Saburo; Okabe, Kazuo; Miura, Yasuki; and Minami, Satoyuki, 4,138,386, Cl. 260-40.00R.

Miwa, Yoshiharu: *See*—
Mizutani, Yutaka; Miwa, Yoshiharu; and Oshima, Mitsuru, 4,138,086, Cl. 249-116.000.

Miyachi, Nobuji; Miyake, Keniti; and Ogawa, Akira, to Miyachi Sewing Machine Co., Ltd. Belt looper apparatus. 4,137,857, Cl. 112-121.270.

Miyachi Sewing Machine Co., Ltd.: *See*—
Miyachi, Nobuji; Miyake, Keniti; and Ogawa, Akira, 4,137,857, Cl. 112-121.270.

Miyagawa, Akira: *See*—
Nagatugi, Shuzo; Miyagawa, Akira; and Fukuoka, Suguru, 4,138,225, Cl. 44-42.000.

Miyagi, Hideo: *See*—
Takeda, Keiso; and Miyagi, Hideo, 4,137,713, Cl. 60-276.000.
Takeda, Keiso; and Miyagi, Hideo, 4,137,714, Cl. 60-276.000.

Miyake, Haruhisa: *See*—
Ukihashi, Hiroshi; Asawa, Tatsuro; Yamabe, Masaaki; and Miyake, Haruhisa, 4,138,373, Cl. 521-38.000.

Miyake, Keniti: *See*—
Miyachi, Nobuji; Miyake, Keniti; and Ogawa, Akira, 4,137,857, Cl. 112-121.270.

Miyamoto, Akio: *See*—
Ishizuka, Akio; and Miyamoto, Akio, 4,138,522, Cl. 428-195.000.

Miyazaki, Yukio: *See*—
Shibata, Akira; Miyazaki, Yukio; Tsuda, Kiyoshi; Otake, Noboru; and Kinashi, Haruyasu, 4,138,496, Cl. 424-283.000.

Mizukuchi, Yutaka, to Citizen Watch Co., Ltd. Liquid crystal composition and method for making same. 4,138,359, Cl. 252-299.000.

Mizutani, Yutaka; Miwa, Yoshiharu; and Oshima, Mitsuru, to Nippon Contact Lens Manufacturing Ltd. Mold for manufacturing contact lenses. 4,138,086, Cl. 249-116.000.

Mo och Domsjo Aktiebolag: *See*—
Hillstrom, Per A. R.; and Norehall, Lars G., 4,138,313, Cl. 162-49.000.

Mobil Oil Corporation: *See*—
Chang, Clarence D.; Jacob, Solomon M.; Silvestri, Anthony J.; and Zahner, John C., 4,138,440, Cl. 260-668.00R.
Chang, Clarence D.; and Silvestri, Anthony J., 4,138,442, Cl. 260-668.00R.
Colombo, Edward A.; Johnson, David E.; and Tsai, James T., 4,137,754, Cl. 73-56.000.
Kettner, Roland; and Unland, Herbert, 4,138,468, Cl. 423-228.000.
Williams, Sherrod A., 4,138,345, Cl. 252-8.55D.

Mochida, Naoki: *See*—
Sato, Hiroshi; Nakatani, Munetsugu; Nakatsui, Hiroshi; Kakita, Hideto; Shimoyama, Hiroyuki; Mochida, Naoki; and Sugimori, Shuichi, 4,138,520, Cl. 428-141.000.

Mochizuki, Toshio; Kajikawa, Shuji; Hirai, Keitaro; and Yasunaga, Masaaki, to Nippon Kokan Kabushiki Kaisha. Furnace top charging apparatus. 4,138,022, Cl. 214-35.00R.

Modenov, Vitaly P.: *See*—
Vereschagin, Leonid F.; Semerchian, Aik A.; Gankevich, Tamara T.; Dmitriev, Mikhail E.; and Modenov, Vitaly P., 4,138,252, Cl. 75-244.000.

Module-Eight Corporation: *See*—
Russell, Hugh M., 4,138,700, Cl. 360-93.000.

Moertel, George B., to Textron Inc. Slide fastener with adjustable stop. 4,137,608, Cl. 24-205.11R.

Mogul Corporation, The: *See*—
Lipinski, Richard J., 4,138,353, Cl. 252-181.000.

Mohammadioun, Said: *See*—
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,138,695, Cl. 360-92.000.

Mohr, Adolf, to Robert Bosch GmbH. Method and arrangement for indirectly ascertaining the rotary speed of a permanent-magnet-stator D.C. motor. 4,138,642, Cl. 324-158.0MG.

Moisa, Vladimir G.: *See*—
Statsenko, Nikolai N.; Kuzub, Vladislav S.; Moisa, Vladimir G.; and Kryzhny, Evgeny A., 4,138,323, Cl. 204-196.000.

Mola, Michel, to Creusot-Loire Vallourec. Continuous casting of metals. 4,137,961, Cl. 164-49.000.

Moneghan, Edward E., to Pennwalt Corporation. Method for forming solid friction material structures. 4,138,463, Cl. 264-40.400.

Monsanto Company: *See*—
Deets, Gary L.; and Shapras, Peter, 4,138,447, Cl. 260-876.00R.

Hahn, Frank J.; and Santer, James O., 4,138,528, Cl. 428-482.000.

Monsanto Company, St. Louis, Missouri: *See*—
King, Henry L.; and Wu, Chester C., 4,138,364, Cl. 252-431.00N.

Montalbano, Anthony P., to Ambico Inc. Rockable photographic tray having a substantially flat interior sheet support. 4,138,689, Cl. 354-337.000.

Montgomery, Ronald, to Short Brothers & Harland Limited. Gas turbine engines. 4,137,711, Cl. 60-226.00A.

Monville, Jean M.; and Waleckx, Jean, to SKF Compagnie d'Applications Mecaniques. Double torsion twisting mechanisms. 4,137,702, Cl. 57-58.740.

Mookherjee, Braja D.; Evers, William J.; and Goossens, Alfred E., to International Flavors & Fragrances Inc. Process for preparing 2-acyl-5-substituted thiatetrahydrofuran-4-ones. 4,138,413, Cl. 260-347.200.

Moore Business Forms, Inc.: *See*—
D'Luhy, Emil A., 4,138,302, Cl. 156-216.000.

Moore, Walter T. Unified array for collection and concentration of solar energy. 4,137,897, Cl. 126-270.000.

Moret, Michel, to Les Produits Associes LPA S.A. Rinsing device for personal hygiene. 4,138,064, Cl. 239-582.000.

Morgan, James A., to Westvaco Corporation. Apparatus for wrapping paper rolls. 4,137,690, Cl. 53-176.000.

Morgan, John H.: *See*—
Daebler, Donald H.; and Morgan, John H., 4,138,018, Cl. 209-633.000.

Mori, Etsuo; Shimiya, Keiji; Miura, Norio; and Suzuki, Yujiro, to Dai Nippon Toryo Co., Ltd. Phosphors and X-ray image converters using the same. 4,138,529, Cl. 428-539.000.

Mori, Shushin: *See*—
Yoneji, Satoshige; Higuchi, Yoshiharu; and Mori, Shushin, 4,137,860, Cl. 112-277.000.

Moritani, Nakanobu, to Kabushiki Kaisha Seikosha. Controlling device for grinding piezo-electric element. 4,137,676, Cl. 51-165.00R.

Moritz, James O.: *See*—
Jennings, Frederick R.; and Moritz, James O., 4,137,984, Cl. 180-98.000.

Morooka, Yasuo: *See*—
Tanifuji, Shinya; and Morooka, Yasuo, 4,137,742, Cl. 72-6.000.

Morozowich, Walter, to Upjohn Company, The. Inter-phenylene-PG pyrrolinylamides. 4,138,549, Cl. 542-426.000.

Morris, William D., to American Formed Plastics Corp. Vehicle wheel well skirt. 4,138,129, Cl. 280-152.00R.

Moses, Charles L., to Intercole Automation, Inc. Tire retread matrix register assembly. 4,138,207, Cl. 425-19.000.

Mossiossian, Varoujan; and Bayer, Karol. Coupling between an above sea-level platform and a below-water foundation. 4,137,722, Cl. 405-202.000.

Motegi, Masahiko; Fujita, Saburo; Okabe, Kazuo; Miura, Yasuki; and Minami, Satoyuki, to Toray Industries, Inc. Polyester film for magnetic tape. 4,138,386, Cl. 260-40.00R.

Motorola, Inc.: *See*—
Beck, Robert L.; and Goebel, Peter H., 4,138,643, Cl. 324-158.00F.
Davidson, Allen L.; and Durante, James M., 4,138,681, Cl. 343-702.000.
Ingle, William M.; and Thompson, Stephen W., 4,138,509, Cl. 427-86.000.

Mueller, Albrecht: *See*—
Sander, Bruno; Mueller, Albrecht; Merkle, Hans; and Janisch, Gerhard, 4,138,269, Cl. 106-90.000.

Muench, Elmer W.: *See*—
Long, Everett J.; and Muench, Elmer W., 4,138,186, Cl. 339-117.00P.

Muhlethaler, Richard V.; and Walls, Richard J., to Arrem Plastics Inc. Lighting fixture enclosure. 4,138,716, Cl. 362-375.000.

Mukai, Junji: *See*—
Nishikawa, Akio; Yokono, Hitoshi; Simizu, Ryuichi; and Mukai, Junji, 4,138,372, Cl. 528-45.000.

Muller, Heinz: *See*—
Strauss, Julius; Hubner, Herbert; Muller, Heinz; and Krempl, Engelbert, 4,138,437, Cl. 260-583.00R.

Muller, Karl: *See*—
Hasselbach, Wolfgang; Leyerzapf, Manfred; Dotter, Klaus; Habfast, Karleugen; and Muller, Karl, 4,138,593, Cl. 179-1.00E.

Muller, Wolfgang-Dieter: *See*—
Kuhnlein, Hans L.; and Muller, Wolfgang-Dieter, 4,138,309, Cl. 159-13.00A.

Mullins, Keith M.; Leppert, Thomas K.; Cannon, Thomas; Kerr, Ronald R.; and Smith, Ronn G., to Teledyne Industries, Inc. Food grinder. 4,138,066, Cl. 241-86.000.

Multinorm B.V.: *See*—
Oosterling, Pieter A.; and Baecke, Antoine M. R., 4,137,783, Cl. 74-47.000.

Munker, Gert, to Palitex Project Company GmbH. Broken yarn transfer mechanisms for textile yarn processing machines. 4,137,700, Cl. 57-261.000.

Munter, Ernst A., to Northern Telecom Limited. Modular communication system having self-identifying modules. 4,138,599, Cl. 179-175.000.

Murakami, Shinichi; Akamatsu, Katsutaro; Yoshimitsu, Arata; and Noji, Sueyoshi, to Kubota, Ltd. Method of producing stainless steel product. 4,138,279, Cl. 148-12.00E.

Murakawa, Toshio: *See*—
Ura, Junichi; and Murakawa, Toshio, 4,138,699, Cl. 360-85.000.

Murasaki, Hiroaki: *See*—
Koizumi, Hisao; Kawada, Yoshinosuke; Murasaki, Hiroaki; and Hisaoka, Satoshi, 4,137,898, Cl. 126-270.000.

Murase, Kenji: *See*—
Unotoro, Tomoyuki; Ueda, Yoichi; Shirouchi, Yasunari; Yamashita, Hideo; Sato, Sei; and Murase, Kenji, 4,138,626, Cl. 315-169.400.

Murata Manufacturing Co., Ltd.: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Tamura, Sadahiro, 4,138,652, Cl. 333-82.00R.

Muratov, Rustem I.; Kot, Jury D.; Belov, Mikhail F.; Gildengorn, Melis S.; Konkov, Vyacheslav S.; and Erlikh, Mikhail I. Device for extruding hollow articles. 4,137,745, Cl. 72-263.000.

Muratsuka, Hiroshi, to Trio Kabushiki Kaisha. Pin type jack-and-plug coupling device. 4,138,182, Cl. 339-89.00M.

Murdock, Keith C.; and Child, Ralph G., to American Cyanamid Company. 1,4-Bis(aminoalkylamino)-anthraquinones and leuco derivatives thereof. 4,138,415, Cl. 260-378.000.

Murphy, Declan S., to Atara Corporation. Sewage aerating structure. 4,138,335, Cl. 210-170.000.

Murphy, Donald H. Method and means for measuring cardiac pumping performance of left ventricle. 4,137,910, Cl. 128-2.05R.

Musgrave, Daniel D. Pistol charging holster. 4,138,044, Cl. 224-2.00B.

Musil, Vaclav: *See*—
Kubela, Rudolf; Musil, Vaclav; and Hughes, Lise A., 4,138,494, Cl. 424-274.000.

Muth, Myron C.: *See*—
Beltran, Adrian M.; Muth, Myron C.; and Schilling, William F., 4,137,619, Cl. 29-156.80H.

Muto, Haruomi: *See*—
Akiyama, Taichiro; and Muto, Haruomi, 4,137,906, Cl. 128-2.00A.

Myhre, Douglas C.: *See*—
Tushie, David R.; and Myhre, Douglas C., 4,137,768, Cl. 73-343.00R.

Myodo, Osamu: *See*—
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makoto; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,138,714, Cl. 362-231.000.

N. Schlumberger & Cie: *See*—
Herubel, Jean F., 4,137,701, Cl. 57-267.000.

Naarmann, Herbert: *See*—
Siegel, Hardo; and Naarmann, Herbert, 4,138,542, Cl. 526-305.000.

Nagai, Yutaka: *See*—
Sakakibara, Shumpei; Nagai, Yutaka; Fujiwara, Kenji; and Sakai, Takahiro, 4,138,394, Cl. 260-112.50R.

Nagata, Masaki: *See*—
Arai, Kozo; Fukui, Shiomi; Nagata, Masaki; and Kotani, Teizo, 4,138,369, Cl. 252-512.000.

Nagata, Wataru: *See*—
Narisada, Masayuki; and Nagata, Wataru, 4,138,486, Cl. 424-248.520.

Nagatani, Kuniaki: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Nagatani, Kuniaki; and Nishimura, Shigeyuki, 4,138,436, Cl. 260-581.000.

Nagatugi, Shuzo; Miyagawa, Akira; and Fukuoka, Suguru, to Daicel Ltd. Match with cellulose nitrate instead of sulfur. 4,138,225, Cl. 44-42.000.

Nahr, Dieter: *See*—
Engelbart, Wilhelm; and Nahr, Dieter, 4,137,655, Cl. 38-12.000.

Naik, Appayya R.: *See*—
Evans, William P.; and Naik, Appayya R., 4,138,435, Cl. 260-567.60M.

Nairn Floors Limited: *See*—
Brown, Robert, 4,138,521, Cl. 428-159.000.

Naito, Takayuki; Okumura, Jun; and Oka, Masahisa, to Bristol-Myers Company. 7-[D-α-(4-Hydroxy-1,5-naphthyridine-3-carboxamido)-α-phenyl (and p-hydroxyphenyl)acetamido]-3-carbamoyloxymethyl-3-cephem-4-carboxylic acids. 4,138,554, Cl. 544-22.000.

Nakagawa, Koji: *See*—
Ishimoto, Sachio; Yamaguchi, Hisao; Kato, Yoshinori; Oba, Takeo; Ozawa, Kenji; Ichikawa, Yataro; Nakagawa, Koji; and Tsuruta, Hideki, 4,138,553, Cl. 544-18.000.

Nakajima, Fumito: *See*—
Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; Watanabe, Yoshihisa; Imanari, Makoto; and Nakajima, Fumito, 4,138,469, Cl. 423-239.000.

Nakajima, Heitaro; Omura, Yoshimoto; and Kawashima, Isao, to Sony Corporation. Tone arm assembly. 4,138,121, Cl. 274-23.00R.

Nakajima, Yutaka: *See*—
Eida, Toshiaki; Saito, Yasuhiro; Saito, Tomiji; Yomoto, Chobe; and Nakajima, Yutaka, 4,138,506, Cl. 426-598.000.

Nakamizo, Nobuhiro; Teranishi, Masayuki; Matsukuma, Ikuo; Shuto, Katsuichi; and Yamada, Koji, to Kyowa Hakko Kogyo Kabushiki Kaisha. Phenylalanine derivatives. 4,138,485, Cl. 424-248.500.

Nakamura, Ken: *See*—
Otsubo, Kizuku; Nakamura, Ken; and Aoyama, Syunich, 4,137,874, Cl. 123-119.00A.

Nakamura, Toshiaki; and Sasaki, Hiroshi, to Yamaha Hatsudoki Kabushiki Kaisha. Safety device. 4,138,601, Cl. 200-61.850.

Nakamuro, Yoshio: *See*—
Katsurayama, Tadashi; and Nakamuro, Yoshio, 4,138,523, Cl. 428-216.000.

Nakano, Masamitsu; and Inoue, Iwao, to Niles Parts Co., Ltd.; and Nihon Dennetsu Co., Ltd. High temperature sensor. 4,138,655, Cl. 338-30.000.

Nakao, Toshihiro, to Olympus Optical Company Limited. Detent device for locking the lid of a cassette receiving compartment of a tape recorder. 4,138,151, Cl. 292-76.000.

Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; and Mazuda, Hiroo, to Nippon Steel Corporation. Method for producing a steel sheet having remarkably excellent toughness at low temperatures. 4,138,278, Cl. 148-12.00R.

Nakata, Shinichi; and Hirano, Reiji, to Canon Kabushiki Kaisha. Electronic equipment capable of arithmetic operations. 4,138,734, Cl. 364-710.000.

Nakata, Yoshinori: *See*—
Ueda, Shigeru; Makino, Kazuo; Nakata, Yoshinori; Hasegawa, Yoshihisa; Yokoyama, Shinichi; Yoshida, Ryoichi; Maekawa, Yousuke; and Yoshida, Yuji, 4,138,035, Cl. 222-1.000.

Nakatani, Munetsugu: *See*—
Sato, Hiroshi; Nakatani, Munetsugu; Nakatsui, Hiroshi; Kakita, Hideto; Shimoyama, Hiroyuki; Mochida, Naoki; and Sugimori, Shuichi, 4,138,520, Cl. 428-141.000.

Nakatsui, Hiroshi: *See*—
Sato, Hiroshi; Nakatani, Munetsugu; Nakatsui, Hiroshi; Kakita, Hideto; Shimoyama, Hiroyuki; Mochida, Naoki; and Sugimori, Shuichi, 4,138,520, Cl. 428-141.000.

Nakatsuka, Hisayoshi, to Ortofon Manufacturing A/S. Pickup. 4,138,122, Cl. 274-37.000.

Nakazono, Akio, to Shin-Shirasuna Electric Corp. Operating mechanism of tape recorder. 4,138,704, Cl. 360-137.000.

Nalco Chemical Company: *See*—
Ries, Donald G.; and Maniscalco, Joseph P., 4,138,431, Cl. 260-502.40P.

Narain, Kartik A., to Cyprus Metallurgical Processes Corporation. Recovery of elemental sulfur and metal values from tailings from copper recovery processes. 4,138,248, Cl. 75-101.00R.

Narikiyo, Yasumasa; and Baba, Osamu, to Okuma Machinery Works Ltd. Position control apparatus for circular tables. 4,138,633, Cl. 318-603.000.

Narisada, Masayuki; and Nagata, Wataru, to Shionogi & Co., Ltd. Arylmalonamido-1-oxadethiacephalosporins. 4,138,486, Cl. 424-248.520.

Nashua Corporation: *See*—
Hiscoe, Ernest C., 4,138,024, Cl. 214-152.000.

Nassry, Assadullah; and Maxwell, Jerrold F., to BASF Wyandotte Corporation. Water-based hydraulic fluid. 4,138,346, Cl. 252-32.500.

National Controls, Inc.: *See*—
Minton, Darrell B., 4,138,197, Cl. 400-474.000.

National Machinery Company, The: *See*—
Grombka, Walter J., 4,137,748, Cl. 72-448.000.

National Research Development Corporation: *See*—
Broadway, Alexander R. W.; Fong, William; and Rawcliffe, Gordon H., 4,138,619, Cl. 310-184.000.

National Semiconductor Corporation: *See*—
Ochi, Sam S., 4,138,614, Cl. 307-251.000.

Nawa, Keiji; and Iwasaki, Masami, to Tokyo Shibaura Electric Co., Ltd. Darlington circuit semiconductor device. 4,138,690, Cl. 357-46.000.

Naylor Industries, Inc.: *See*—
Sentell, John S., 4,137,928, Cl. 134-167.00C.

Nazarenus, Carl L., to Boeing Commercial Airplane Company. Drill stop. 4,138,200, Cl. 408-241.00S.

NDM Corporation: *See*—
Hix, Ernet T., 4,137,909, Cl. 128-2.06E.

Nedreski, Robert J., to General Electric Company. Constant horsepower control for grinding wheel drives. 4,137,677, Cl. 51-165.770.

Nehmer, Carl A.; and Sweet, Douglas W., to General Motors Corporation. Motor vehicle speed control system. 4,138,723, Cl. 364-424.000.

Nehmsmann, Louis J.: *See*—
Verdiccio, Robert J.; and Nehmsmann, Louis J., 4,138,371, Cl. 252-545.000.

Nelson, Norman A.: *See*—
Bundy, Gordon L.; and Nelson, Norman A., 4,138,573, Cl. 560-55.000.
Bundy, Gordon L.; and Nelson, Norman A., 4,138,575, Cl. 560-55.000.
Bundy, Gordon L.; and Nelson, Norman A., 4,138,576, Cl. 560-55.000.
Bundy, Gordon L.; and Nelson, Norman A., 4,138,577, Cl. 560-55.000.

Nelson Research & Development Company: *See*—
Fuxe, Kjell, 4,138,484, Cl. 424-247.000.

Neno, Gervais S., to International Paper Company. Method and apparatus for batch production of pulp including improved energy reclamation. 4,138,311, Cl. 162-28.000.

Neratoom B.V.: *See*—
Speelman, Jan E., 4,138,318, Cl. 176-18.000.

Netzow, Paul: *See*—
Weslow, Harold J., 4,137,899, Cl. 126-271.000.

Neubauer, Gerald; Van Wauwe, Gerard; Beullens, Josef; Brand, Uwe; Fuchs, Hugo; and Kartte, Klaus, to BASF Aktiengesellschaft. Process for obtaining coarsely crystalline pure ammonium sulfate. 4,138,472, Cl. 423-549.000.

Neuffer, Ingemar: *See*—
Bayer, Karl-Heinz; Blaschke, Felix; Neuffer, Ingemar; and Michel, Wolfgang, 4,138,729, Cl. 364-603.000.

Neumann, Daniel L., to Dexter Corporation, The. Water-based container end sealing compositions. 4,138,384, Cl. 260-29.70S.

Neumann, Manfred: *See*—
Cosack, Claus; Hein, Wolfgang; Hese, Nils; Neumann, Manfred; and Willemer, Wilhelm, 4,137,756, Cl. 73-64.300.

Newmayer, Rickey L. Circular grater for cutting plastic. 4,137,617, Cl. 29-78.000.

NGK Insulators, Ltd.: *See*—
Suzuki, Go, 4,137,628, Cl. 29-625.000.

NGK Spark Plug Co., Ltd.: *See*—
Yoshida, Mitsutaka; and Kawakami, Toshikazu, 4,137,883, Cl. 123-148.00P.

Nicks, Peter F., to Imperial Chemical Industries Limited. Coating compositions. 4,138,376, Cl. 260-22.0TN.

Niederprum, Hans: *See*—
Meussdoerffer, Johann N.; Bockelmann, Wolfgang; and Niederprum, Hans, 4,138,466, Cl. 423-61.000.

Niederste-Hollenberg, Heinz; Sacher, Christoph; Fickenscher, Friedrich; and Eichinger, Johann, to Carl Hurth Maschinen-und Zahnradfabrik. Lift control device for propeller drive systems on watercrafts. 4,137,862, Cl. 115-41.0HT.

Nier, Thomas J.; and Edge, Charles K., to PPG Industries, Inc. Submerged plate for selective diversion of molten metal flow in a glass forming chamber. 4,138,239, Cl. 65-182.00R.

Nigra, Antonio, to Gilardini S.p.A. Fuel diaphragm pump with shut-off valve. 4,137,889, Cl. 123-198.0DB.

Nihon Dennetsu Co., Ltd.: *See*—
Nakano, Masamitsu; and Inoue, Iwao, 4,138,655, Cl. 338-30.000.

Nikitin, Jury F.: *See*—
Zinevich, Vladimir D.; Yarmolenko, Georgy Z.; Sinyavsky, Vladimir S.; Romanenko, Nikolai T.; and Nikitin, Jury F., 4,138,206, Cl. 418-153.000.

Niles Parts Co., Ltd.: *See*—
Nakano, Masamitsu; and Inoue, Iwao, 4,138,655, Cl. 338-30.000.

Nilsson, Ragnar H. Foldable rhombic hook blank. 4,138,081, Cl. 248-300.000.

Nippon Contact Lens Manufacturing Ltd.: *See*—
Mizutani, Yutaka; Miwa, Yoshiharu; and Oshima, Mitsuru, 4,138,086, Cl. 249-116.000.

Nippon Electric Co., Ltd.: *See*—
Bonkohara, Manabu; and Kasuga, Hisao, 4,138,691, Cl. 357-70.000.
Koyama, Kaoru; Kyuzaki, Tsutomu; and Kikuchi, Toshimoto, 4,138,625, Cl. 315-3.500.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Suzuki, Katsuo, 4,138,701, Cl. 360-96.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Ogawa, Masanobu; and Kojima, Toshitake, 4,138,365, Cl. 252-435.000.
Orita, Ryuzo; and Kurosawa, Mitsuru, 4,138,558, Cl. 544-189.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Mochizuki, Toshio; Kajikawa, Shuji; Hirai, Keitaro; and Yasunaga, Masaaki, 4,138,022, Cl. 214-35.00R.

Nippon Oil Company, Ltd.: *See*—
Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, 4,138,377, Cl. 260-23.70A.

Nippon Steel Corporation: *See*—
Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; and Mazuda, Hiroo, 4,138,278, Cl. 148-12.00R.

Nischk, Gunther: *See*—
Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, 4,138,393, Cl. 526-287.000.

Nishihira, Keigo: *See*—
Yamasaki, Toshiharu; Eguchi, Masao; Uchiumi, Schinichiro; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, 4,138,587, Cl. 560-204.000.

Nishikawa, Akio; Yokono, Hitoshi; Simizu, Ryuichi; and Mukai, Junji, to Hitachi, Ltd. Resin compositions containing polyepoxides and uretdiones. 4,138,372, Cl. 528-45.000.

Nishikawa, Toshio; Ishikawa, Youhei; and Tamura, Sadahiro, to Murata Manufacturing Co., Ltd. Dielectric resonator capable of suppressing spurious mode. 4,138,652, Cl. 333-82.00R.

Nishimura, Masaru: *See*—
Ikemoto, Zenichi; and Nishimura, Masaru, 4,138,725, Cl. 364-502.000.

Nishimura, Shigeyuki: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Nagatani, Kuniaki; and Nishimura, Shigeyuki, 4,138,436, Cl. 260-581.000.

Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Nagatani, Kuniaki; and Nishimura, Shigeyuki, to Ishihara Sangyo Kaisha Ltd. Process for producing 3,5-dichloroaniline from 1-bromo-2,4-dichlorobenzene. 4,138,436, Cl. 260-581.000.

Nissan Diesel Motor Company, Ltd.: *See*—
Hiramatsu, Iwao, 4,137,886, Cl. 123-188.0AF.

Nissan Motor Company, Limited: *See*—
Hiraiwa, Kazuyoshi, 4,137,790, Cl. 74-473.00R.
Mine, Junichi; Iizuka, Akio; Yoneshige, Tetsuhiko; and Ito, Hidefumi, 4,138,367, Cl. 252-466.0PT.
Otsubo, Kizuku; Nakamura, Ken; and Aoyama, Syunich, 4,137,874, Cl. 123-119.00A.

Niwa, Kazuo, to Tokyo Shibaura Electric Co., Ltd. Apparatus for the treatment of semiconductors. 4,138,306, Cl. 156-345.000.

NL Industries, Inc.: *See*—
Pierce, Elwood K., Jr., 4,138,144, Cl. 285-18.000.

Nobbs, John W. Racket and throat piece therefor. 4,138,109, Cl. 273-73.00G.

Noel Penny Turbines Limited: *See*—
Clarke, John M., 4,137,706, Cl. 60-39.120.

Noeske, Heinz: *See*—
Tummes, Hans; Noeske, Heinz; Cornils, Boy; and Kascha, Waldemar, 4,138,588, Cl. 568-881.000.

Nogi, Tatsuo; Yoshizawa, Yasuo; Kashihara, Kanzi; Yoshizumi, Nobuo;

and Tsuda, Yoshizo, to Toray Industries, Inc. Flame retardant fiber. 4,138,445, Cl. 260-844.000.
Noji, Sueyoshi: *See*—
Murakami, Shinichi; Akamatsu, Katsutaro; Yoshimitsu, Arata; and Noji, Sueyoshi, 4,138,279, Cl. 148-12.00E.
Nordsiek, Karl-Heinz: *See*—
Berg, Gerhard, deceased; and Nordsiek, Karl-Heinz, 4,138,375, Cl. 260-17.00R.
Nordstrom, Torbjorn: *See*—
Blomberg, Folke I.; Holst, Jan-Olov M.; and Nordstrom, Torbjorn, 4,138,165, Cl. 303-115.000.
Norehall, Lars G.: *See*—
Hillstrom, Per A. R.; and Norehall, Lars G., 4,138,313, Cl. 162-49.000.
Noren, John P. Apparatus for piped conveyance of material. 4,138,162, Cl. 302-50.000.
Noro, Shuhei; Hayashi, Kunio; and Wada, Yoshisada, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of concentric grinding. 4,137,674, Cl. 51-281.00R.
North American Products Corp.: *See*—
Segal, Arthur R.; and Robertson, Jack E., 4,137,806, Cl. 83-478.000.
Northern Telecom Limited: *See*—
Dyment, John C., 4,138,274, Cl. 148-1.500.
Munter, Ernst A., 4,138,599, Cl. 179-175.000.
Norton Company: *See*—
Alliegro, Richard A., 4,138,456, Cl. 264-65.000.
Norton, Harry W.: *See*—
Brown, Leslie A.; and Norton, Harry W., 4,138,133, Cl. 280-405.00B.
Novatronics, Inc.: *See*—
Brauns, Frank; and Sullivan, John L., Jr., 4,137,856, Cl. 112-104.000.
Noverola, Armando V.; Soto, Jose P.; and Spickett, R. G. W., to Anphar, S.A. Aromatic amides of heterocyclic compounds and therapeutic compositions containing same. 4,138,492, Cl. 424-267.000.
Novo Laboratories, Incorporated: *See*—
McMullen, William H.; and Carasik, William, 4,138,290, Cl. 195-31.00F.
Nunlist, Erwin J., to Sybron Corporation. Balancing mechanism for manhole covers. 4,137,669, Cl. 49-386.000.
Nyi, Kayson: *See*—
Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., 4,138,390, Cl. 260-45.90L.
Oagley, Jack R., to Xerox Corporation. Staple cassette. 4,138,076, Cl. 242-103.000.
Oba, Takeo: *See*—
Ishimoto, Sachio; Yamaguchi, Hisao; Kato, Yoshinori; Oba, Takeo; Ozawa, Kenji; Ichikawa, Yataro; Nakagawa, Koji; and Tsuruta, Hideki, 4,138,553, Cl. 544-18.000.
O'Brian, Edward D.; and Plachy, William M. Folding structures useful as two-wheeled carts. 4,138,140, Cl. 280-652.000.
Ochi, Sam S., to National Semiconductor Corporation. JFET switch circuit. 4,138,614, Cl. 307-251.000.
Odazima, Mituo; Kikuchi, Rokuro; and Ataka, Arata, to Hitachi, Ltd. Magneto for motor vehicle. 4,137,884, Cl. 123-149.00D.
Oelke, Waldemar W.: *See*—
Eggert, John N.; Herrington, Richard A.; and Oelke, Waldemar W., 4,138,237, Cl. 65-104.000.
Oettgen, Herbert F.: *See*—
Truscheit, Ernst; Bierling, Robert; Schlumberger, Horst D.; and Oettgen, Herbert F., 4,138,479, Cl. 424-88.000.
Ogawa, Akira: *See*—
Miyachi, Nobuji; Miyake, Keniti; and Ogawa, Akira, 4,137,857, Cl. 112-121.270.
Ogawa, Iwakichi, to Takara Co., Ltd. Toy vehicle with optical weapons system. 4,137,666, Cl. 46-202.000.
Ogawa, Masanobu; and Kojima, Toshitake, to Nippon Kayaku Kabushiki Kaisha. Catalyst for the manufacture of methacrylic or acrylic acid. 4,138,365, Cl. 252-435.000.
Ohira, Toshiaki; Hara, Eisuke; and Takagi, Yasuo, to Ajinomoto Co., Inc. Process for preparing caramel. 4,138,271, Cl. 127-34.000.
Ohno, Ryotaro: *See*—
Arakawa, Masatoshi; Ohno, Ryotaro; Ishikawa, Katuhiro; Yamahara, Noboru; and Matsui, Hisashi, 4,138,419, Cl. 260-429.00R.
Oka, Masahisa: *See*—
Naito, Takayuki; Okumura, Jun; and Oka, Masahisa, 4,138,554, Cl. 544-22.000.
Okabe, Kazuo: *See*—
Motegi, Masahiko; Fujita, Saburo; Okabe, Kazuo; Miura, Yasuki; and Minami, Satoyuki, 4,138,386, Cl. 260-40.00R.
Okada, Kenji, to Tokico Ltd. Fuel supplying apparatus having a linearly movable, constant height hose unit. 4,138,042, Cl. 222-529.000.
Okajima, Yakutaro, to Parke, Davis & Company. Enteric capsules. 4,138,013, Cl. 206-528.000.
Okubo. Hiroshi: *See*—
Kaetsu, Isao; Okubo, Hiroshi; and Yoshii, Fumio, 4,138,300, Cl. 204-159.220.
Kaetsu, Isao; Okubo, Hiroshi; and Yoshii, Fumio, 4,138,538, Cl. 526-73.000.
Okuma Machinery Works Ltd.: *See*—
Narikiyo, Yasumasa; and Baba, Osamu, 4,138,633, Cl. 318-603.000.
Okumura, Akio: *See*—
Hirose, Takeshi; Shiba, Keisuke; Yokota, Yukio; Inouye, Kozo; and Okumura, Akio, 4,138,258, Cl. 96-74.000.
Okumura, Haruto. Helicopter-carried rescue apparatus. 4,138,077, Cl. 244-118.00P.
Okumura, Jun: *See*—
Naito, Takayuki; Okumura, Jun; and Oka, Masahisa, 4,138,554, Cl. 544-22.000.
Okuno Chemical Industry Company, Limited: *See*—
Arisato, Yasunori; and Koriyama, Hideaki, 4,138,267, Cl. 106-1.230.
Okuzumi, Yuzi; Mellon, A. Darline; and Wasserman, David, to Ethicon, Inc. Addition copolymers of lactide and glycolide and method of preparation. 4,137,921, Cl. 128-335.500.
Olin Corporation: *See*—
Fullington, Michael C.; and Hirdler, Louis C., 4,138,559, Cl. 544-192.000.
Gay, Walter A., 4,138,438, Cl. 260-646.000.
Mitchell, William D.; Adams, John O.; and Simmons, John J., 4,137,752, Cl. 73-45.500.
Olney, Robert S.; and Wade, Charles G. Production of explosive emulsions. 4,138,281, Cl. 149-2.000.
Olschewski, Armin: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,138,167, Cl. 308-6.00C.
Olsen, Roger F.; and Cantley, George, to Incom International Inc. Adjustable interlock hand lever. 4,137,799, Cl. 74-876.000.
Olszewski, Jerzy A.; and Sarkar, Arnab, to General Cable Corporation. Multiple fiber laminate for optical waveguides. 4,138,193, Cl. 350-96.230.
Olympia Werke AG: *See*—
Achenbach, Karlheinz; and Bruckel, Dieter, 4,137,597, Cl. 15-256.510.
Olympic Fastening Systems, Inc.: *See*—
Siebol, George, 4,137,817, Cl. 85-78.000.
Olympus Optical Company: *See*—
Yamasita, Nobuo, 4,138,192, Cl. 350-25.000.
Olympus Optical Company Limited: *See*—
Nakao, Toshihiro, 4,138,151, Cl. 292-76.000.
Omura, Yoshimoto: *See*—
Nakajima, Heitaro; Omura, Yoshimoto; and Kawashima, Isao, 4,138,121, Cl. 274-23.00R.
O'Neill, Wilbur J., to Diver's Exchange Inc. Diving apparatus. 4,137,912, Cl. 128-142.300.
Ono, Shin-etu: *See*—
Ishikawa, Fumiyoshi; Kosasayama, Akira; Watanabe, Yoshifumi; Abiko, Yasushi; Kameda, Kin-ya; and Ono, Shin-etu, 4,138,491, Cl. 424-263.000.
Ontario Energy Corporation: *See*—
Kaminsky, Victor; Trevoy, Lloyd W.; and Maskwa, Alvin, 4,138,467, Cl. 423-74.000.
Oosterling, Pieter A.; and Baecke, Antoine M. R., to Multinorm B.V. Device for converting a rotary movement into a reciprocatory movement. 4,137,783, Cl. 74-47.000.
Oprandi, Pierre: *See*—
Lehureau, Jean-Claude; and Oprandi, Pierre, 4,138,663, Cl. 340-146.30F.
Optel Corporation: *See*—
Chen, Schoen-nan, 4,138,532, Cl. 429-111.000.
Optilon W. Erich Heilmann GmbH: *See*—
Heimberger, Helmut, 4,137,733, Cl. 66-195.000.
Orient Chemical Industries, Ltd.: *See*—
Maekawa, Yoshihiro; and Matsuura, Masatoshi, 4,138,424, Cl. 260-453.0SP.
Orita, Ryuzo; and Kurosawa, Mitsuru, to Nippon Kayaku Kabushiki Kaisha. Anthraquinone compounds. 4,138,558, Cl. 544-189.000.
Ortho Pharmaceutical Corp.: *See*—
Leininger, Robert I.; Preston, Joseph R.; and Lower, Brenton R., 4,137,922, Cl. 128-344.000.
Ortofon Manufacturing A/S: *See*—
Nakatsuka, Hisayoshi, 4,138,122, Cl. 274-37.000.
Osborne, Turner E., to General Motors Corporation. Gas generator. 4,137,847, Cl. 102-39.000.
Oshima, Mitsuru: *See*—
Mizutani, Yutaka; Miwa, Yoshiharu; and Oshima, Mitsuru, 4,138,086, Cl. 249-116.000.
Oskar Frech Werkzeugbau, Firma: *See*—
Frech, Wolfgang, 4,138,043, Cl. 222-596.000.
Otake, Noboru: *See*—
Shibata, Akira; Miyazaki, Yukio; Tsuda, Kiyoshi; Otake, Noboru; and Kinashi, Haruyasu, 4,138,496, Cl. 424-283.000.
Otsubo, Kizuku; Nakamura, Ken; and Aoyama, Syunich, to Nissan Motor Company, Limited. Exhaust gas recirculation control system. 4,137,874, Cl. 123-119.00A.
Otsuki, Yutaka; Araki, Yoshihiko; and Aoyama, Kazuho, to Nippon Oil Company, Ltd. Coating composition and process for its preparation. 4,138,377, Cl. 260-23.70A.
Ottesen, Ludger, to Windmoller & Holscher. Rotary intaglio printing press with an insertable and withdrawable inking mechanism. 4,137,843, Cl. 101-153.000.
Ottosson, Bertil S. P.: *See*—
Sander, Nils B. L.; and Ottosson, Bertil S. P., 4,138,002, Cl. 188-196.00D.
Owens-Corning Fiberglas Corporation: *See*—
Greenwood, Mark E., 4,138,031, Cl. 220-71.000.
Owens-Illinois, Inc.: *See*—
Conklin, Charles S., 4,138,026, Cl. 215-12.00R.
Price, James H.; and Smalley, Ned J., 4,138,028, Cl. 215-216.000.
Ozaki, Tsutomu: *See*—
Uyama, Noboru; and Ozaki, Tsutomu, 4,137,978, Cl. 177-165.000.

Ozawa, Kenji: *See*—
Ishimoto, Sachio; Yamaguchi, Hisao; Kato, Yoshinori; Oba, Takeo; Ozawa, Kenji; Ichikawa, Yataro; Nakagawa, Koji; and Tsuruta, Hideki, 4,138,553, Cl. 544-18.000.

Ozols, Karlis V. Force-responsive device. 4,138,600, Cl. 200-61.470.

Pabst Brewing Company: *See*—
Strauss, Karl M.; Geller, Harold H.; and Wagner, Bernd J., 4,138,499, Cl. 426-16.000.

Pacer Industries, Inc.: *See*—
Stock, Hugh J., 4,138,040, Cl. 222-420.000.

Page, David G. S.: *See*—
Heanley, Charles P.; Tylko, Jozef K.; and Page, David G. S., 4,137,866, Cl. 118-106.000.

Pahlman, John E.; and Khalafalla, Sanna E., to United States of America, Interior. Selective recovery of nickel, cobalt, manganese from seam nodules with sulfurous acid. 4,138,465, Cl. 423-49.000.

Pako Corporation: *See*—
Engelmann, Rudolph H., 4,138,607, Cl. 219-485.000.

Palitex Project Company GmbH: *See*—
Munker, Gert, 4,137,700, Cl. 57-261.000.

Palmer, Allen J., to Xerox Corporation. Automatic document processing device. 4,138,102, Cl. 271-3.000.

Palmer Instruments, Inc.: *See*—
Young, Dan B.; and Binford, Benjamin L., 4,137,771, Cl. 73-363.900.

Panabeam Corp.: *See*—
Szpur, Roman, 4,138,713, Cl. 362-218.000.

Pantasote Company, The: *See*—
McAlarney, Fred R., 4,138,049, Cl. 277-80.000.

Panzer, Hans P.; and Acholonu, Kenny U., to American Cyanamid Company. 2-Acylamidoethyl-2-tetrahydropyrimidines. 4,138,563, Cl. 544-335.000.

Pao, Cohon. Portable battery operated manicure devices. 4,137,926, Cl. 132-73.600.

Paragon Gears Incorporated: *See*—
Benson, Carl L., Jr., 4,138,006, Cl. 192-48.910.

Parato, Vito J., to Cutler-Hammer, Inc. Wideband signal calibration system. 4,138,645, Cl. 325-363.000.

Parato, Vito J., to Cutler-Hammer, Inc. Wideband absolute calibration system. 4,138,646, Cl. 325-363.000.

Pardes, Herman; Sherburne, Frederick B.; and Schwartz, Joseph R., to United States of America, Army. Moving target practice firing simulator. 4,137,651, Cl. 35-25.000.

Parke, Davis & Company: *See*—
Okajima, Yakutaro, 4,138,013, Cl. 206-528.000.

Parker-Hannifin Corporation: *See*—
Cyrot, Luc P., 4,138,088, Cl. 251-30.000.
Sharp, Bernard C., 4,137,598, Cl. 15-250.420.

Parker, Robert. Method and apparatus for determining internal temperature of an object. 4,137,769, Cl. 73-356.000.

Parks, Stanley M. Gauge for lens lapping tools or the like. 4,137,640, Cl. 33-174.00A.

Parsons, John H., to Fisons Limited. Acaricidal pyridinium salts. 4,138,548, Cl. 542-421.000.

Partyka, Richard A.: *See*—
Crenshaw, Ronnie R.; Luke, George M.; and Partyka, Richard A., 4,138,561, Cl. 544-284.000.

Pasley, Edward L., to A. P. Green Refractories Co. Fastening device for securing wear-resistant tiles to a backing. 4,137,681, Cl. 52-127.000.

Passler, Helmar: *See*—
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,138,298, Cl. 204-159.120.

Pate, Floyd V.: *See*—
Pickrell, James M.; and Pate, Floyd V., 4,138,130, Cl. 280-154.50R.

Patil, Arvind S.; and Weissman, Eugene Y., to BASF Wyandotte Corporation. Method of forming diaphragms from discrete thermoplastic fibers requiring no bonding or cementing. 4,138,314, Cl. 162-102.000.

Patitz, Ellen: *See*—
Bobeth, Wolfgang; Heger, Adolf; Passler, Helmar; Roloff, Hermann; Patitz, Ellen; Schwind, Adolf-Ernst; and Zilinski, Erwin, 4,138,298, Cl. 204-159.120.

Patt, Ludwig: *See*—
Ehrhardt, Lothar; Patt, Ludwig; and Hartmann, Volker, 4,138,565, Cl. 544-346.000.

Patton, Willard T.; and Landry, Norman R., to RCA Corporation. Short radiating horn with an S-shaped radiating element. 4,138,683, Cl. 343-783.000.

Paulson, Harold E. Perfector printer press. 4,137,844, Cl. 101-218.000.

Pauwels, Michael A.; and Tew, Sydney K., to Pneumo Corporation. Pulse width modulator digital servo system. 4,138,632, Cl. 318-599.000.

Payne, Larry E.; and Lancaster, Kenneth D., Jr. Liquid container lid. 4,138,033, Cl. 220-254.000.

Payne, Robert D., to Continental Group, Inc., The. Mechanical powder flow diverting device. 4,138,161, Cl. 302-28.000.

PDM Consulting and Development Corp.: *See*—
Carlson, John E.; and Carlson, Richard W., 4,137,596, Cl. 15-203.000.

Pearl, David R.: *See*—
Gerber, Heinz J.; and Pearl, David R., 4,137,804, Cl. 83-177.000.

Peck, Reese A.: *See*—
Wilson, Raymond F.; Peck, Reese A.; Herbstman, Sheldon; and Mih, Li C., 4,138,227, Cl. 44-62.000.

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Procida, Francesco P.; Pedersen, Svend S.; and Carstensen, Peter, 4,138,462, Cl. 264-347.000.

Pennekamp, Gunther, to Pennekamp & Huesker KG, Firma. Method for producing a molding compound. 4,138,388, Cl. 260-42.460.

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Pennekamp, Gunther, 4,138,388, Cl. 260-42.460.

Pennock, Michael D., to British Petroleum Company Limited, The. Drilling method. 4,137,975, Cl. 175-65.000.

Pennwalt Corporation: *See*—
Moneghan, Edward E., 4,138,463, Cl. 264-40.400.

Perkin-Elmer Corporation, The: *See*—
Schlesinger, Eugene R., 4,138,612, Cl. 307-237.000.

Perkins Engines Limited: *See*—
Dunn, Stephen J., 4,137,887, Cl. 123-193.00P.

Peruzzotti, George P.: *See*—
Woessner, Warren D.; Biddlecom, William G.; Arndt, Henry C.; Peruzzotti, George P.; and Sih, Charles J., 4,138,582, Cl. 560-118.000.
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Peters, Clifford M.: *See*—
Hargraves, Melvin J.; and Peters, Clifford M., 4,137,942, Cl. 137-557.000.

Petersen, Ross K. Oscillatory food warming apparatus. 4,137,835, Cl. 99-348.000.

Peterson, Harley G. Folding grain drill drive including seed dispensing clutch actuated by tensioning pully on ground drive. 4,137,853, Cl. 111-67.000.

Pevzner, Leonid M.: *See*—
Kazurov, Alexandr A.; Pevzner, Leonid M.; Mikhalina, Alexandra E.; Kachkov, Nikolai P.; Lapshinov, Georgy S.; Sedov, Nikolai S.; Kainkov, Nikolai P.; and Anisimov, Stanislav M., 4,137,951, Cl. 139-68.000.

Peyman, Gholam A.; Koziol, Jeffrey E.; Fried, Walter I.; and Sanders, Donald R. Operating microscope with two pairs of stereo eye-piece lenses. 4,138,191, Cl. 350-19.000.

Pfanzer, Gerhard, to Black and Decker Manufacturing Company, The. Jig-saw. 4,137,632, Cl. 30-393.000.

Pfeiffer, Werner B. Decorative object comprising panels joined with slide fasteners. 4,137,683, Cl. 52-506.000.

Pfiffner, Albert: *See*—
Chodnekar, Madhukar S.; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,138,579, Cl. 560-64.000.

Pfizer Inc.: *See*—
Holland, Gerald F., 4,138,399, Cl. 260-239.800.

Phalangas, Charalambos J.; Restaino, Alfred J.; and Yun, HanBo, to Marathon Oil Company. Process for recovering oil from subterranean formations. 4,137,969, Cl. 166-274.000.

Phares, Lindsey J.: *See*—
Gendron, George J.; and Phares, Lindsey J., 4,138,199, Cl. 405-232.000.

Phillips, Carmen S.: *See*—
Knapp, William H.; Phillips, Carmen S.; and Anderson, Walter A., 4,137,697, Cl. 56-341.000.

Phillips, David W.: *See*—
Heard, Roderick S.; Hill, James D.; and Phillips, David W., 4,138,688, Cl. 346-75.000.

Phillips, Donald E.: *See*—
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Phillips Petroleum Company: *See*—
Doss, Richard C., 4,138,378, Cl. 260-27.0BB.
Hsieh, Henry L., 4,138,536, Cl. 526-19.000.
Marrs, Oren L.; Reusser, Robert E.; and Tieszen, Dale O., 4,138,516, Cl. 428-36.000.
Slagel, John E.; and Howard, Allen C., 4,138,217, Cl. 422-151.000.

Pickett, David A.; and Acs, Steven N., to Allied Chemical Corporation. Energy absorbing seat belt webbing. 4,138,157, Cl. 297-386.000.

Pickett, John E. P.; and Franklin, Burton P., to Triangle Biomedical Equipment, Inc. Disposable blade holder. 4,137,631, Cl. 30-337.000.

Pickrell, James M.; and Pate, Floyd V. Shield assembly for towed trailer. 4,138,130, Cl. 280-154.50R.

Pidgeon, Brian G.; and Dowell, Joseph, to Coal Industry (Patents) Limited. Controlled bunker systems. 4,138,010, Cl. 198-573.000.

Pierce, Elwood K., Jr., to NL Industries, Inc. Wellhead sealing assembly. 4,138,144, Cl. 285-18.000.

Ping-ho, Lin: *See*—
Tung-lung, Ho; and Ping-ho, Lin, 4,137,715, Cl. 60-310.000.

Pinkham, Carlos F. A.: *See*—
Wallace, Volney; and Pinkham, Carlos F. A., 4,137,667, Cl. 47-26.000.

Pitney-Bowes, Inc.: *See*—
Allocca, Michael A.; and Cinque, Gregory M., 4,138,735, Cl. 364-900.000.

Pitts, Robert W., Jr.: *See*—
Howard, Curtis E.; Calvin, Douglas G.; and Pitts, Robert W., Jr., 4,137,968, Cl. 166-53.000.

Pittway Corporation: *See*—
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Schneider, Quentin L.; and Schwarzbach, Richard J., 4,138,670, Cl. 340-507.000.

Plachy, William M.: *See—*
O'Brian, Edward D.; and Plachy, William M., 4,138,140, Cl. 280-652.000.

Plackett, Michael J., to Rohr Industries, Inc. Stay supported membrane planing seal. 4,137,987, Cl. 180-126.000.

Planiol, Rene. Centrifugal vacuum impact pulverizing mills. 4,138,067, Cl. 241-275.000.

Platt, Clark I.; and Merchant, Howard D., to Whirlpool Corporation. Double acting agitator with clothes lifting cams. 4,137,736, Cl. 68-134.000.

Platz, Rolf: *See—*
Baur, Karl G.; Hellbach, Hans; Platz, Rolf; and Taglieber, Kurt, 4,138,591, Cl. 568-756.000.

Plessey Handel und Investments AG: *See—*
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Pneumo Corporation: *See—*
Pauwels, Michael A.; and Tew, Sydney K., 4,138,632, Cl. 318-599.000.

Poi, Kenneth J., to General Motors Corporation. Apparatus for marking a mold surface. 4,137,962, Cl. 164-236.000.

Polaroid Corporation: *See—*
Kinsman, Gordon F., 4,137,627, Cl. 29-623.400.
Rogers, Howard G., 4,138,254, Cl. 96-29.00D.

Pollet, Robert J.: *See—*
Gilliams, Yvan K.; De Volder, Noel J.; Pollet, Robert J.; Tavernier, Bernard H.; De Jaeger, Nikolaas C.; and Sels, Francis J., 4,138,351, Cl. 252-62.10L.

Polmanteer, Keith E., to Dow Corning Corporation. Hydrophilic, water-swellable, crosslinked, copolymer gel and prosthesis employing same. 4,138,382, Cl. 260-29.6TA.

Polysar Limited: *See—*
Edwards, Douglas C., 4,138,389, Cl. 260-45.70R.

Ponsford, Roger J.: *See—*
Howarth, Thomas T.; Brown, Allan G.; Corbett, David F.; and Ponsford, Roger J., 4,138,403, Cl. 260-307.0FA.

Porper, Robert P. Toothbrush and method of making the same. 4,137,593, Cl. 15-167.00A.

Porter, Gary D.; and Bogdanoff, Anatoly, to United States of America, Energy. Magnetic confinement system using charged ammonia targets. 4,138,317, Cl. 176-1.000.

Posselt, Gunther: *See—*
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Postupack, Dennis S., to PPG Industries, Inc. Method of forming graded shade band on substrate. 4,138,284, Cl. 156-100.000.

Potier, Pierre: *See—*
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Potoski, John R.: *See—*
Freed, Meier E.; and Potoski, John R., 4,138,564, Cl. 544-346.000.
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PPG Industries, Inc.: *See—*
Goldinger, John A., 4,137,803, Cl. 83-881.000.
Nier, Thomas J.; and Edge, Charles K., 4,138,239, Cl. 65-182.00R.
Postupack, Dennis S., 4,138,284, Cl. 156-100.000.
Turner, Warren H., 4,138,235, Cl. 65-27.000.

PQ Corporation: *See—*
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Pratt, Ronald L., to Deere & Company. Forwardly foldable toolbar. 4,137,852, Cl. 111-57.000.

Precision Monolithics, Inc.: *See—*
Comer, Donald T.; Dooley, Daniel J.; and Schoeff, John A., 4,138,671, Cl. 340-347.0DA.

Preston, Joseph R.: *See—*
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Preti, Edmond; and Ripy, Howard W., to United Technologies Corporation. Surge detector for gas turbine engines. 4,137,710, Cl. 60-223.000.

Price, James H.; and Smalley, Ned J., to Owens-Illinois, Inc. Child-resistant safety closure. 4,138,028, Cl. 215-216.000.

Primbsch, Erik, to Krautkramer-Branson, Incorporated. Method and apparatus for producing ultrasonic waves in light absorbing surfaces of workpieces. 4,137,778, Cl. 73-627.000.

Procida, Francesco P.; Pedersen, Svend S.; and Carstensen, Peter, to Aktieselskabet Nordiske Kabel- og Traadfabriker. Method of manufacturing cross-linked moulded objects from cross-linkable polymeric materials. 4,138,462, Cl. 264-347.000.

Procter & Gamble Company, The: *See—*
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Prokai, Bela; and Kanner, Bernard, to Union Carbide Corporation. Acrylonitrile-capped polyether-siloxanes. 4,138,391, Cl. 260-465.600.

Protectoseal Co., The: *See—*
Zehr, William J., 4,138,037, Cl. 222-166.000.

Prue, Oscar. Storage box bumper assembly for vehicles. 4,138,152, Cl. 293-117.000.

Pryor, Taylor A. Method and apparatus for growing seafood in commercially significant quantities on land. 4,137,868, Cl. 119-2.000.

Ptaar, Hubertus, to Bayer Aktiengesellschaft. Indoline linked to 2-pyrazoline. 4,138,570, Cl. 548-379.000.

Purdue Research Foundation: *See—*
McKenzie, Bruce A., 4,138,021, Cl. 214-17.00C.

Puskas, Imre; and Fields, Ellis K., to Standard Oil Company (Indiana). Imide nitrogen dibenzofurans. 4,138,392, Cl. 528-208.000.

Quadrastat Controls Corporation: *See—*
Lauper, Warner R., 4,137,864, Cl. 116-28.100.

Quartz-Zeit AG: *See—*
Sudler, Roland, 4,138,617, Cl. 310-49.00R.

Quinn, Halsey P., to Xerox Corporation. Alternating current generator using light dependent resistor. 4,138,635, Cl. 323-21.000.

Rabley, Derek S., to M. Myers & Son Limited. Storage tray assembly. 4,138,015, Cl. 206-561.000.

Rampon Products, Incorporated: *See—*
Swallow, Roger T., 4,137,763, Cl. 73-159.000.

Ramspott, Walter: *See—*
Kramer, Friedhelm; Wolfertz, Gunter; Klaus, Harald; Stanik, Raimund; and Ramspott, Walter, 4,137,607, Cl. 24-95.000.

Raquet, Erwin, to Fried. Krupp Huttenwerke AG. Measuring wheel. 4,137,760, Cl. 73-146.000.

Rath, Michael B. Diaphragm vent valve for fluid storage tank with vapor recovery system. 4,137,943, Cl. 137-587.000.

Rathjen, Hans-Carl: *See—*
Koziol, Konrad; Rathjen, Hans-Carl; and Sieberer, Karl-Heinz, 4,138,510, Cl. 427-124.000.

Rauf, James P.: *See—*
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Raymond International, Inc.: *See—*
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RCA Corporation: *See—*
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Hedlund, Lee V.; and Luther, Arch C., 4,138,741, Cl. 365-234.000.
Patton, Willard T.; and Landry, Norman R., 4,138,683, Cl. 343-783.000.
Smith, Joseph L., 4,138,628, Cl. 315-368.000.
Stave, Frederick R.; and Torrington, Leslie A., 4,138,703, Cl. 360-133.000.
Wine, Charles M., 4,138,647, Cl. 325-464.000.

Reber, Jean-Francois: *See—*
Steiger, Rolf; Reber, Jean-Francois; Ezekiel, Aaron D.; and Ficken, Geoffrey E., 4,138,551, Cl. 542-435.000.

Redman, Charles M., to United States of America, Army. Fiber interferometer rotary motion sensor. 4,138,196, Cl. 356-350.000.

Reedy, Charles E., to ACF Industries, Incorporated. Adapter for bottom operable tank car valve. 4,137,937, Cl. 137-321.000.

Reese, Gunter; Weinrich, Erwin; and Lieske, Edgar, to Henkel Kommanditgesellschaft Auf Aktien (Henkel KGaA). Agents for reducing the damage to hair during bleaching and dyeing. 4,138,478, Cl. 424-62.000.

Regie Nationale des Usines Renault: *See—*
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Rehfeld, Frederick L. J., to General Motors Corporation. Rotary hydraulic servo for steering gear. 4,137,989, Cl. 180-148.000.

Reichelt, Walter: *See—*
Harmsen, Nils; Markhof, Horst; Reichelt, Walter; Schiff, Klaus-Ludwig; and Thiede, Horst, 4,138,604, Cl. 200-267.000.

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Reid, John A. Adjustable foundation window form. 4,138,084, Cl. 249-83.000.

Reid, Joyce: *See—*
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Reid, Neil M.: *See—*
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Reinehr, Ulrich; and Schmidt, Wolfhard, to Bayer Aktiengesellschaft. Dry spinning coarse-denier acrylic fibres. 4,138,461, Cl. 264-206.000.

Rembaum, Alan; Yen, Shiao-Ping S.; and Dreyer, William J., to California Institute of Technology. Preparation of small bio-compatible microspheres. 4,138,383, Cl. 260-29.70H.

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Rendemonti, Louis. Apparatus for spraying diverse fluids within the cab of a vehicle. 4,137,952, Cl. 141-27.000.

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Resnicow, Leon, to Vishay Intertechnology, Inc. Attachment of leads to electrical components. 4,138,656, Cl. 338-322.000.

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Reusser, Robert E.: *See—*
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Rex, Robert W. Method for energy extraction from hot dry rock systems. 4,137,719, Cl. 60-641.000.

Rex, Robert W. Use of calcium halide-water as a heat extraction me-

dium for energy recovery from hot rock systems. 4,137,720, Cl. 60-641.000.
Rhodes, Clifford A.: *See*—
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Rhodes, John R.; Sieberg, Robert D.; Taylor, Morris C.; Westkaemper, John C.; and Young, Robert C., to Columbia Scientific Industries, Inc. Aerial prospecting. 4,137,751, Cl. 73-28.000.
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Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,138,487, Cl. 424-250.000.
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Rhone-Poulenc S.A.: *See*—
Fort, Jean F.; and Giraudon, Raymond, 4,138,404, Cl. 260-307.00A.
Riccardi, Rocco. Apparatus for verification of the Pythagorean theorem. 4,137,652, Cl. 35-34.000.
Rice, Donald D.; and Walton, Herbert H., to Fisher Controls Company. Valve construction. 4,137,934, Cl. 137-270.000.
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Richardson-Merrell Inc.: *See*—
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Richarg Wolf GmbH: *See*—
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Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, to Upjohn Company, The. Bis-cyclic ureas. 4,138,398, Cl. 260-239.30R.
Riedel, Tilo, to S.A. Etablissements Francois Salomon & Fils. Ski brake. 4,138,136, Cl. 280-605.000.
Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Slide-articulation bearing, in particular for tiltable converters. 4,138,166, Cl. 308-3.00R.
Ries, Donald G.; and Maniscalco, Joseph P., to Nalco Chemical Company. Reaction of α-phosphorus containing carboxylic acids with phosphorous acid to prepare scale and corrosion inhibitors. 4,138,431, Cl. 260-502.40P.
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Ringel, Samuel M.: *See*—
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Robandt, William F., II; and Spiegel, Raymond W., to Whirlpool Corporation. One-piece agitator with clothes directing cam. 4,137,737, Cl. 68-134.000.
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Robinson, Barry J., to Fairchild Camera and Instrument Corporation. Schottky bipolar two-port random-access memory. 4,138,739, Cl. 365-174.000.
Robinson, Charles H. Athletic hand/wrist positioner. 4,138,108, Cl. 273-54.00B.
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Roche, Alain Y. Equipments for connecting PCM multiplex digital transmission systems having different nominal bit rates. 4,138,596, Cl. 179-15.0BV.
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Rodland, Arild. Torque indicator apparatus. 4,137,758, Cl. 73-139.000.
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Rohr Industries, Inc.: *See*—
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Rolles, Rolf; Williams, James E., Jr.; and Kondis, Thomas J., to Aluminum Company of America. Method of producing glossy or frosted powder coatings. 4,138,511, Cl. 427-201.000.
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Rosengren, Knut T. L. Dockboard apparatus. 4,137,587, Cl. 14-71.300.
Rosof, Barry H., to Cabot Corporation. Process for recovering valuable metals from superalloy scrap. 4,138,249, Cl. 75-103.000.
Ross, Hugh McD.; and Simmonds, Edwin, to Loewy Robertson Engineering Co., Ltd. Frangible strip threading apparatus for rolling mill. 4,138,074, Cl. 242-78.100.
Rossebo, Conrad. Price-marking stamp device. 4,137,846, Cl. 101-379.000.
Rossi, Silvano, to Roussel UCLAF. Malonanilic derivatives. 4,138,572, Cl. 560-43.000.
Rost, Harry, to Metzeler Kautschuk AG. Axially adjustable fire construction drum. 4,138,307, Cl. 156-415.000.
Roussel UCLAF: *See*—
Rossi, Silvano, 4,138,572, Cl. 560-43.000.
Rowe, Raymond C.: *See*—
McAinsh, James; and Rowe, Raymond C., 4,138,475, Cl. 424-19.000.
Rowley, Peter C., to Surrette, Roy. Nonslip guitar pick. 4,137,814, Cl. 84-322.000.
Rowley, William N.: *See*—
Ehret, Gordon F.; and Rowley, William N., 4,138,079, Cl. 248-558.000.
Rudd, Ralph E.; and Huggins, John I., to Sherwood Medical Industries Inc. Method of making a plastic tube with plural lumens. 4,138,457, Cl. 264-500.000.
Rudis, Robert P.; and Ceccon, Harry L., to United States of America, Transportation. Automatic base gate positioning circuit. 4,137,776, Cl. 73-611.000.
Ruhrchemie Aktiengesellschaft: *See*—
Lutze, Siegfried; Schneller, Peter; Birnkraut, Hans-Walter; Berzen, Josef; and Hetkamp, Gunter, 4,138,540, Cl. 526-159.000.
Tummes, Hans; Noeske, Heinz; Cornils, Boy; and Kascha, Waldemar, 4,138,588, Cl. 568-881.000.
Rule, Robert J., to W. H. Brine Co. Lacrosse stick with peripherally grooved support tabs. 4,138,111, Cl. 273-96.00D.
Rumble, Edgar B., to Michigan Pipe Fittings Company. Pipe coupling with a wedging contractible ring. 4,138,146, Cl. 285-39.000.
Rumold, Gerhard: *See*—
Winkler, Heinrich; Rumold, Gerhard; and Schummer, Helmut, 4,138,232, Cl. 55-105.000.
Russell, Hugh M., to Module-Eight Corporation. Container for using a miniaturized cartridge in an eight-track player. 4,138,700, Cl. 360-93.000.
Russillo, Joseph G.; and Earl, William C., to General Electric Company. Data recording system for indicating power outage on master and slave recorders. 4,138,697, Cl. 360-6.000.
Rutt, Paul A., to Tenneco, Inc. Insulated exhaust system component. 4,137,993, Cl. 181-282.000.
SAB Industri AB: *See*—
Sander, Nils B. L.; and Ottosson, Bertil S. P., 4,138,002, Cl. 188-196.00D.
Sacher, Christoph: *See*—
Niederste-Hollenberg, Heinz; Sacher, Christoph; Fickenscher, Friedrich; and Eichinger, Johann, 4,137,862, Cl. 115-41.0HT.
Saito, Masaaki. Electronic closed loop air-fuel ratio control system. 4,137,877, Cl. 123-119.0EC.
Saito, Masato: *See*—
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makoto; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,138,714, Cl. 362-231.000.

Saito, Syunji: *See*—
Tadakuma, Yuji; Saito, Syunji; and Eguchi, Toru, 4,138,733, Cl. 364-900.000.
Saito, Tomiji: *See*—
Eida, Toshiaki; Saito, Yasuhiro; Saito, Tomiji; Yomoto, Chobe; and Nakajima, Yutaka, 4,138,506, Cl. 426-598.000.
Saito, Yasuhiro: *See*—
Eida, Toshiaki; Saito, Yasuhiro; Saito, Tomiji; Yomoto, Chobe; and Nakajima, Yutaka, 4,138,506, Cl. 426-598.000.
Sakai, Takahiro: *See*—
Sakakibara, Shumpei; Nagai, Yutaka; Fujiwara, Kenji; and Sakai, Takahiro, 4,138,394, Cl. 260-112.50R.
Sakakibara, Shumpei; Nagai, Yutaka; Fujiwara, Kenji; and Sakai, Takahiro, to Ajinomoto Co., Inc. Peptide derivatives and a method of measuring collagenase activity. 4,138,394, Cl. 260-112.50R.
Sakurada, Ichio: *See*—
Kajinaga, Yoshihiro; Sakurada, Ichio; and Ito, Shunji, 4,138,250, Cl. 75-201.000.
Salathiel, William M.: *See*—
Shaughnessy, Christopher M.; and Salathiel, William M., 4,137,971, Cl. 166-295.000.
Sammak, Emil G.; Ladish, Douglas J.; Martin, John J.; and LeClaire, Claire D., to Reichhold Chemicals, Inc. Textile composite and method for making same. 4,138,518, Cl. 428-95.000.
Sammann, Ernest F. Corn harvesters. 4,137,695, Cl. 56-119.000.
Sandberg, Glenn A.; and Howe, George N., to Formax, Inc. Processor-stacker for papered food patties and like layered objects. 4,137,604, Cl. 17-32.000.
Sander, Bruno; Mueller, Albrecht; Merkle, Hans; and Janisch, Gerhard, to BASF Aktiengesellschaft. Conversion of viscous, reactive chlorine- and sulfur-containing production residues into solid products which can be dumped. 4,138,269, Cl. 106-90.000.
Sander, Bruno; Bonitz, Eckhard; Voss, Heinz; and Gaerber, Wolfgang, to BASF Aktiengesellschaft. Production of paper sheets, boards and pulp molded articles from fibrids from the constituents of the effluent obtained in the manufacture of styrene bead polymers. 4,138,315, Cl. 162-146.000.
Sander, Nils B. L.; and Ottosson, Bertil S. P., to SAB Industri AB. Slack adjuster for a rail vehicle brake system. 4,138,002, Cl. 188-196.00D.
Sanders, Donald R.: *See*—
Peyman, Gholam A.; Koziol, Jeffrey E.; Fried, Walter I.; and Sanders, Donald R., 4,138,191, Cl. 350-19.000.
Sandoz Ltd.: *See*—
Baumann, Werner, 4,138,414, Cl. 260-372.000.
Ehrhardt, Lothar; Patt, Ludwig; and Hartmann, Volker, 4,138,565, Cl. 544-346.000.
Sandt, Clayton C.; and Kulp, Ira L. Portable cleaning device. 4,137,588, Cl. 15-22.00R.
Santer, James O.: *See*—
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Sappi Limited: *See*—
Gill, Ronald A.; Wojtowicz, Waldemar S.; Berthold, Cornelius E.; and Wheeler, Cecil M., 4,138,312, Cl. 162-30.00R.
Sarka, Albert J. Cutting apparatus. 4,137,829, Cl. 93-36.00A.
Sarkar, Arnab: *See*—
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Sarrach, Donald J.: *See*—
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Sarto, Jorma O., to Chrysler Corporation. Time delay apparatus for an exhaust gas recirculation controller. 4,137,880, Cl. 123-119.00A.
Sasaki, Hiroshi: *See*—
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Sato, Hiroshi; Nakatani, Munetsugu; Nakatsui, Hiroshi; Kakita, Hideto; Shimoyama, Hiroyuki; Mochida, Naoki; and Sugimori, Shuichi, to Mitsubishi Rayon Co., Ltd. Translucent polypropylene film and process for producing the same. 4,138,520, Cl. 428-141.000.
Sato, Kenichi: *See*—
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Sato, Sei: *See*—
Unotoro, Tomoyuki; Ueda, Yoichi; Shirouchi, Yasunari; Yamashita, Hideo; Sato, Sei; and Murase, Kenji, 4,138,626, Cl. 315-169.400.
Saurer, Eric; and Grimm, Maurice, to Ebauches S.A. Electro-optic passive display device. 4,138,195, Cl. 350-345.000.
Savage, Albert B.: *See*—
Teot, Arthur S.; Hamlin, Percy J.; and Savage, Albert B., 4,138,352, Cl. 252-135.000.
Savage, Donald S.: *See*—
Clarke, Ronald L. C.; and Savage, Donald S., 4,137,747, Cl. 72-391.000.
Saviano, Francesco: *See*—
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Scagnelli, George J., to Textron, Inc. Apparatus and method of applying staple-like bottom stops to slide fasteners and the like. 4,137,621, Cl. 29-408.000.
Scanlon, William J.: *See*—
Meeker, Robert G.; Scanlon, William J.; and Segal, Zvi, 4,138,692, Cl. 357-82.000.
Schabert, Hans-Peter; and Bohm, Bernhard, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor installation with a light-water reactor. 4,138,319, Cl. 176-65.000.
Schaeffer-Homberg GmbH: *See*—
Kramer, Friedhelm; Wolfertz, Gunter; Klaus, Harald; Stanik, Raimund; and Ramspott, Walter, 4,137,607, Cl. 24-95.000.
Schaer, Werner: *See*—
Swanstrom, H. Wallace; Campbell, Kenneth C.; and Schaer, Werner, 4,138,719, Cl. 364-200.000.
Schafer, Howard C.: *See*—
Ulrich, Richard D.; Maples, Crill; and Schafer, Howard C., 4,137,966, Cl. 165-30.000.
Schaffer, Gregory L., to Emerson Electric Co. Amplifier system. 4,138,649, Cl. 330-9.000.
Schamberg, Eckehard: *See*—
Fock, Jurgen; Schamberg, Eckehard; and Hoffmann, Wolfgang, 4,138,450, Cl. 260-881.000.
Schaumberg, Arnold G. Manual slicer and dicer apparatus for fruits and vegetables. 4,137,807, Cl. 83-599.000.
Schellenberg, Matthias: *See*—
Chylewski, Christoph; Jan, Gerald; Kurzen, Roland; Meier, Max; and Schellenberg, Matthias, 4,138,256, Cl. 96-53.000.
Schenk, Gerhard: *See*—
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Schering Corporation: *See*—
Sherlock, Margaret H.; and Roebke, Heide, 4,138,488, Cl. 424-250.000.
Schewe, Richard A., to Barber-Colman Company. Dual drive for cone winding. 4,138,071, Cl. 242-18.0DD.
Schiff, Klaus-Ludwig: *See*—
Harmsen, Nils; Markhof, Horst; Reichelt, Walter; Schiff, Klaus-Ludwig; and Thiede, Horst, 4,138,604, Cl. 200-267.000.
Schilling, William F.: *See*—
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Schimitschek, Erhard J.: *See*—
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Schirtzinger, Joseph F., to Sea-Log Corporation. Captured air bubble arctic vehicle with ice cutters. 4,137,986, Cl. 180-119.000.
Schlapfer-Illi, Hans, deceased (by Schlapfer-Illi, Nelly, Legal Representative), to Ciba-Geigy Corporation. 4-(V-triazolyl)-styryl otpical brighteners. 4,138,552, Cl. 542-462.000.
Schlapfer-Illi, Nelly, Legal Representative: *See*—
Schlapfer-Illi, Hans, deceased, 4,138,552, Cl. 542-462.000.
Schleinitz, Henry M.: *See*—
Beasley, John K.; Beckerbauer, Richard; Schleinitz, Henry M.; and Wilson, Frank C., 4,138,194, Cl. 350-96.300.
Schlesinger, Eugene R., to Perkin-Elmer Corporation, The. Circuit having adjustable clipping level. 4,138,612, Cl. 307-237.000.
Schloffel, Paul. Method and device for dewatering solid suspensions. 4,138,332, Cl. 210-73.00R.
Schlumberger, Horst D.: *See*—
Truscheit, Ernst; Bierling, Robert; Schlumberger, Horst D.; and Oettgen, Herbert F., 4,138,479, Cl. 424-88.000.
Schmid, Max: *See*—
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Schmidt, Manfred: *See*—
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Schmidt, Reinhard: *See*—
Janssen, Paul, deceased; Meyer, Gunther; Thewalt, Klaus; and Schmidt, Reinhard, 4,138,544, Cl. 528-272.000.
Schmidt, Wolfhard: *See*—
Reinehr, Ulrich; and Schmidt, Wolfhard, 4,138,461, Cl. 264-206.000.
Schneeberger, Stephen A.: *See*—
Jansen, William D.; Haney, Jerry D.; Day, Christopher C.; and Schneeberger, Stephen A., 4,137,907, Cl. 128-2.05M.
Schneider, Franz; Waller, Eugen; Buchler, Wolfram; and Weber, Heinz, to L. Schuler GmbH. Mechanical press drive arrangement. 4,138,005, Cl. 192-12.00C.
Schneider, Quentin L.; and Schwarzbach, Richard J., to Pittway Corporation. A.C. powered detecting device with battery backup. 4,138,670, Cl. 340-507.000.
Schneider, Quentin L.: *See*—
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Schneider, Wolfgang: *See*—
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Schneller, Peter: *See*—
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Schnitzler, Erwin. Use of a high capacity aeration compartment in a multiple aeration system. 4,138,328, Cl. 210-7.000.
Schoeff, John A.: *See*—
Comer, Donald T.; Dooley, Daniel J.; and Schoeff, John A., 4,138,671, Cl. 340-347.0DA.
Scholle Corporation: *See*—
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Scholle, William R., to Scholle Corporation. Single operation normally closed coupling valve. 4,137,930, Cl. 137-68.00R.
Scholz, Manfred; and Gollasch, Bernd, to Kraftwerk Union Aktiengesellschaft. Lifting device. 4,138,321, Cl. 176-87.000.
Schreyer, Kenneth D., to Columbus McKinnon Corporation. Coupling shackle. 4,137,704, Cl. 59-86.000.
Schucht, Peter: *See*—
Leypold, Dieter; and Schucht, Peter, 4,138,679, Cl. 343-100.0SA.
Schultz, Neithart; Vahlensieck, Hans-Joachim; and Martens, Peter, to

Dynamit Nobel Aktiengesellschaft. Method of preparing 1,1-difluoroethane. 4,138,439, Cl. 260-653.600.
Schulz, David A., to Union Carbide Corporation. Highly-handleable pitch-based fibers. 4,138,525, Cl. 428-367.000.
Schulz, Eduard: *See*—
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Schummer, Helmut: *See*—
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Schurger, Rainer: *See*—
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Schwartz, Joseph R.: *See*—
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Conforti, Frederick J.; Schwarzbach, Richard J.; and Schneider, Quentin L., 4,138,664, Cl. 340-507.000.
Schneider, Quentin L.; and Schwarzbach, Richard J., 4,138,670, Cl. 340-507.000.
Schwarze, Rigobert. Process and apparatus for bending two tubes with one extending through the other. 4,137,743, Cl. 72-150.000.
Schweiger, Richard G. Nitrite esters of polyhydroxy polymers. 4,138,535, Cl. 526-7.000.
Schweizer, Eduard H. Record cleaning device. 4,138,123, Cl. 274-47.000.
Schwieter, Ulrich: *See*—
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Schwind, Adolf-Ernst: *See*—
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Schwitters, Wayne J. Beet harvester with spring system for protecting its lifter wheels and paddle shaft. 4,137,973, Cl. 171-58.000.
Scofield, John E. Method and apparatus for transporting canvas murals. 4,137,656, Cl. 38-102.910.
Scott, Norman H., to UOP Inc. Vapor/liquid distributor for fixed-bed catalytic reaction chambers. 4,138,327, Cl. 208-146.000.
Scott, Steven W.; and Vaughn, Howard A., Jr., to General Electric Company. Organic silane stabilized and plasticized polycarbonate composition. 4,138,379, Cl. 260-29.10R.
Scovill Manufacturing Company: *See*—
Boutell, Richard G.; and Grigsby, Carroll M., 4,137,824, Cl. 91-1.000.
Scragg, Edgar P. Apparatus for dosing a flowing fluid. 4,137,932, Cl. 137-101.110.
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Sebag, Henri: *See*—
Vanlerberghe, Guy; and Sebag, Henri, 4,138,427, Cl. 260-459.00A.
Sedenquist, John C., Sr., to West Point Pepperell, Inc. Drop wire circuit tester. 4,138,631, Cl. 318-490.000.
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Kazurov, Alexandr A.; Pevzner, Leonid M.; Mikhalina, Alexandra E.; Kachkov, Nikolai P.; Lapshinov, Georgy S.; Sedov, Nikolai S.; Kainkov, Nikolai P.; and Anisimov, Stanislav M., 4,137,951, Cl. 139-68.000.
Segal, Arthur R.; and Robertson, Jack E., to North American Products Corp. Silencing means for rotary cutting tools particularly circular saws. 4,137,806, Cl. 83-478.000.
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Segl, Walter E., Jr., to Exxon Research & Engineering Co. Process for manufacturing blown film sheeting. 4,138,453, Cl. 264-22.000.
Seiko Seiki Kabushiki Kaisha: *See*—
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Seiler, Klaus-Dieter: *See*—
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Sekimoto, Shigeki; and Suzuki, Katsuyuki, to Taimei Kinzoku Kogyo Kabushiki Kaisha. Ball valve. 4,137,936, Cl. 137-246.220.
Sekisui Jushi Kabushiki Kaisha: *See*—
Maekawa, Minoru; and Kurobe, Makoto, 4,137,622, Cl. 29-411.000.
Selleck Nicholls Williams (E.C.C.) Limited: *See*—
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Semerchian, Aik A.: *See*—
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Senn, Charles. Welding gun. 4,137,828, Cl. 92-117.00R.
Sentell, John S., to Naylor Industries, Inc. Apparatus for cleaning the interior of tubes. 4,137,928, Cl. 134-167.00C.
SGX Sulzer-General Atomic Warmetauscher Aktiengesellschaft: *See*—
Hirschle, Georg, 4,137,967, Cl. 165-162.000.
Shaikh, Mohammed N.; Cutler, Ivan B.; Virkar, Anil V.; and Gordon, Ronald S., to University of Utah. Method for preparing dense, beta-alumina ceramic bodies by liquid phase sintering. 4,138,455, Cl. 264-56.000.
Shannon, Suel G., to AMP Incorporated. Coaxial cable plug with center conductor as center contact. 4,138,188, Cl. 339-177.00E.
Shapras, Peter: *See*—
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Sharber, Norman G. Insect and reptile barrier for outdoorsmen. 4,137,584, Cl. 5-344.000.
Sharp, Bernard C., to Parker-Hannifin Corporation. Windshield wiper blade holder having articulated molded yokes. 4,137,598, Cl. 15-250.420.
Sharp, Richard S.: *See*—
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Shatterproof Glass Corporation: *See*—
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Shaughnessy, Christopher M.; and Salathiel, William M., to Exxon Production Research Company. Method of consolidating a subterranean formation. 4,137,971, Cl. 166-295.000.
Shave, David G., to Western Geophysical Co. of America. Shipboard apparatus for measuring ocean currents. 4,138,657, Cl. 340-3.00D.
Shaw, Wilfrid G.; and Terrill, David B., to Standard Oil Company, The. Process for producing unsaturated aliphatic acids and catalysts therefore. 4,138,366, Cl. 252-464.000.
Sheldon, Walter M., Jr., to Fansteel Inc. Dart fletching assembly. 4,138,113, Cl. 273-106.50C.
Shell Oil Company: *See*—
Boyce, Clive B. C.; and Webb, Shirley B., 4,138,402, Cl. 546-275.000.
McLaughlin, William A.; and Berkshire, David C., 4,137,972, Cl. 166-307.000.
Verschuur, Eke, 4,138,226, Cl. 44-51.000.
Shennan, John H., to Selleck Nicholls Williams (E.C.C.) Limited. Building panel. 4,137,684, Cl. 52-602.000.
Sherburne, Frederick B.: *See*—
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Sherlock, Margaret H.; and Roebke, Heide, to Schering Corporation. Diphenylmethyl picolinic acid derivatives and their use as anti-acne agents. 4,138,488, Cl. 424-250.000.
Sherman, Charles J., to Western Electric Company, Inc. Fluid bearing. 4,138,047, Cl. 226-7.000.
Sherrill, James T. Mailbox signal. 4,138,056, Cl. 232-35.000.
Sherry, Howard S.: *See*—
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Sherwood Medical Industries Inc.: *See*—
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Shiao, Daniel D., to Eastman Kodak Company. Antifoggants in certain photographic and photothermographic materials that include silver salts of 3-amino-1,2,4-mercaptotriazole. 4,138,265, Cl. 96-114.100.
Shiba, Keisuke: *See*—
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Shibata, Akira; Miyazaki, Yukio; Tsuda, Kiyoshi; Otake, Noboru; and Kinashi, Haruyasu, to Kaken Chemical Co., Ltd. SY-1 substance. 4,138,496, Cl. 424-283.000.
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Shiley Scientific Incorporated: *See*—
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Shimadzu Seisakushi, Ltd.: *See*—
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Shimiya, Keiji: *See*—
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Shimizu, Kazuyuki: *See*—
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Shimoyama, Atsushi, to Fujitsu Limited. Character reader. 4,138,662, Cl. 340-146.3MA.
Shimoyama, Hiroyuki: *See*—
Sato, Hiroshi; Nakatani, Munetsugu; Nakatsui, Hiroshi; Kakita, Hideto; Shimoyama, Hiroyuki; Mochida, Naoki; and Sugimori, Shuichi, 4,138,520, Cl. 428-141.000.
Shin-Shirasuna Electric Corp.: *See*—
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Shintani, Tutomu: *See*—
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Shionogi & Co., Ltd.: *See*—
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Shirouchi, Yasunari: *See*—
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Shisido, Tadao: *See*—
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Short Brothers & Harland Limited: *See*—
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Shumrak, George K.: *See—*
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Shuto, Katsuichi: *See—*
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Siders, Worthy G., Jr. Puzzle assembly. 4,138,116, Cl. 273-157.00R.
Sieberer, Karl-Heinz: *See—*
Koziol, Konrad; Rathjen, Hans-Carl; and Sieberer, Karl-Heinz, 4,138,510, Cl. 427-124.000.
Sieberg, Robert D.: *See—*
Rhodes, John R.; Sieberg, Robert D.; Taylor, Morris C.; Westkaemper, John C.; and Young, Robert C., 4,137,751, Cl. 73-28.000.
Siebol, George, to Olympic Fastening Systems, Inc. Blind rivet with recessed expanding head. 4,137,817, Cl. 85-78.000.
Siegel, Hardo; and Naarmann, Herbert, to BASF Aktiengesellschaft. Polymers which contain 2-(4-methyl-cyclohex-3-en-1-yl)-propyl-N-acrylamide or -N-methacrylamide groups. 4,138,542, Cl. 526-305.000.
Siegert, Daniel H.; and Banki, Steven, to Koppers Company, Inc. Self-lubricating gear-type spindle coupling. 4,137,999, Cl. 184-45.00R.
Siemens Aktiengesellschaft: *See—*
Bayer, Karl-Heinz; Blaschke, Felix; Neuffer, Ingemar; and Michel, Wolfgang, 4,138,729, Cl. 364-603.000.
Becker, Friedbert; Grafinger, Wilhelm; and Hildebrandt, Bernhard, 4,138,676, Cl. 343-6.50R.
Leypold, Dieter; and Schucht, Peter, 4,138,679, Cl. 343-100.0SA.
Weinkauf, Burghard, 4,138,610, Cl. 250-445.00T.
Winkler, Heinrich; Rumold, Gerhard; and Schummer, Helmut, 4,138,232, Cl. 55-105.000.
Sih, Charles J.: *See—*
Woessner, Warren D.; Biddlecom, William G.; Arndt, Henry C.; Peruzzotti, George P.; and Sih, Charles J., 4,138,582, Cl. 560-118.000.
Woessner, Warren D.; Biddlecom, William G.; Arndt, Henry C.; Peruzzotti, George P.; and Sih, Charles J., 4,138,583, Cl. 560-118.000.
Sihver, Jaak-Juri: *See—*
Chaveron, Michel; Sihver, Jaak-Juri; and Duperrex, Hubert, 4,138,501, Cl. 426-239.000.
Silvestri, Anthony J.: *See—*
Chang, Clarence D.; Jacob, Solomon M.; Silvestri, Anthony J.; and Zahner, John C., 4,138,440, Cl. 260-668.00R.
Chang, Clarence D.; and Silvestri, Anthony J., 4,138,442, Cl. 260-668.00R.
Simizu, Ryuichi: *See—*
Nishikawa, Akio; Yokono, Hitoshi; Simizu, Ryuichi; and Mukai, Junji, 4,138,372, Cl. 528-45.000.
Simmonds, Edwin: *See—*
Ross, Hugh McD.; and Simmonds, Edwin, 4,138,074, Cl. 242-78.100.
Simmons Fastener Corporation: *See—*
Hoen, Cuyler, 4,137,610, Cl. 24-221.00K.
Simmons, John J.: *See—*
Mitchell, William D.; Adams, John O.; and Simmons, John J., 4,137,752, Cl. 73-45.500.
Simonson, Lloyd G.; and Lamberts, Burton L., to United States of America, Navy. Plaque dispersing enzymes as oral therapeutic agents by molecular alteration. 4,138,476, Cl. 424-50.000.
Sinclair, Robert O., Jr., to United States of America, Army. Acceleration filter for slowdown discrimination. 4,138,677, Cl. 343-8.000.
Single Buoy Moorings Inc.: *See—*
Van Heijst, Willem J., 4,137,948, Cl. 138-120.000.
Sinyavsky, Vladimir S.: *See—*
Zinevich, Vladimir D.; Yarmolenko, Georgy Z.; Sinyavsky, Vladimir S.; Romanenko, Nikolai T.; and Nikitin, Jury F., 4,138,206, Cl. 418-153.000.
Sisk, Francis J.; and Fagan, Thomas J., to Electric Power Research Institute, Inc. Two-speed drive apparatus. 4,137,798, Cl. 74-812.000.
SKF Compagnie d'Applications Mecaniques: *See—*
Monville, Jean M.; and Waleckx, Jean, 4,137,702, Cl. 57-58.740.
SKF Industries, Inc.: *See—*
Stolz, Robert; and Hahn, Walter, 4,138,169, Cl. 308-189.00R.
SKF Kugellagerfabriken GmbH: *See—*
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,138,167, Cl. 308-6.00C.
Kunkel, Heinrich; Schurger, Rainer; and Matyschik, Otto, 4,138,171, Cl. 308-233.000.
Skilling, Derek, to Imperial Chemical Industries Limited. Cooling thermoplastic tubes. 4,138,458, Cl. 264-540.000.
Skimovex B.V.: *See—*
Middelbeek, Cornelis G.; Wolters, Tjako A.; and Den Boer, Jan B., 4,138,342, Cl. 210-522.000.
Skottheim, Leif H.: *See—*
Jansson, Janne K. G.; and Skottheim, Leif H., 4,137,572, Cl. 2-16.000.
Slack, Don S. Swash plate compressor. 4,138,203, Cl. 417-269.000.
Slagel, John E.; and Howard, Allen C., to Phillips Petroleum Company. Carbon black reactor. 4,138,217, Cl. 422-151.000.
Smalley, Ned J.: *See—*
Price, James H.; and Smalley, Ned J., 4,138,028, Cl. 215-216.000.
Smick, Ronald H. Apparatus for forming turbulators. 4,137,744, Cl. 72-196.000.
Smith, Benjamin D.: *See—*
Hontgas, Christopher P.; and Smith, Benjamin D., 4,137,849, Cl. 102-56.00R.
Smith, Eugene L., Jr.: *See—*
Wang, Samuel S.; and Smith, Eugene L., Jr., 4,138,350, Cl. 252-61.000.
Smith International, Inc.: *See—*
Decker, Raymond E., 4,137,974, Cl. 173-147.000.
Smith, Jack R., to Frito-Lay, Inc. Mounting device. 4,138,019, Cl. 211-87.000.
Smith, Joseph L., to RCA Corporation. Magnetizing method for use with a cathode ray tube. 4,138,628, Cl. 315-368.000.
Smith, Robert G. Filter cartridge. 4,138,337, Cl. 210-238.000.
Smith, Ronn G.: *See—*
Mullins, Keith M.; Leppert, Thomas K.; Cannon, Thomas; Kerr, Ronald R.; and Smith, Ronn G., 4,138,066, Cl. 241-86.000.
Smith, William D. Wireline apparatus for use in earth boreholes. 4,137,762, Cl. 73-151.000.
SmithKline Corporation: *See—*
Berges, David A., 4,138,556, Cl. 544-26.000.
Smits, Johannes W.: *See—*
van Rij, Johannes D.; and Smits, Johannes W., 4,137,605, Cl. 17-46.000.
Snamprogetti S.p.A.: *See—*
Lagana, Vincenzo; and Saviano, Francesco, 4,138,434, Cl. 260-555.00A.
Snowdon, Brian, to Macawber Engineering Limited. Valve assembly. 4,137,935, Cl. 137-242.000.
Sobieski, John C.: *See—*
Downing, Robert D.; and Sobieski, John C., 4,138,621, Cl. 313-113.000.
Sochol, Irving; and Welsh, Jay Y., to Chemetals Corporation. Preparation of manganese/cobalt bromide. 4,138,354, Cl. 252-182.000.
S.A. Etablissements Francois Salomon & Fils: *See—*
Riedel, Tilo, 4,138,136, Cl. 280-605.000.
Societe Anonyme Francaise du Ferodo: *See—*
Fenart, Jean-Claud, 4,137,786, Cl. 74-230.17E.
Societe Chauvin Arnoux: *See—*
Arnoux, Daniel, 4,138,717, Cl. 363-156.000.
Societe CM Industries: *See—*
Faisandier, Yves, 4,137,940, Cl. 137-486.000.
Societe d'Assistance Technique Pour Produits Nestle S.A.: *See—*
Chaveron, Michel; Sihver, Jaak-Juri; and Duperrex, Hubert, 4,138,501, Cl. 426-239.000.
Societe Francaise des Produits pour Catalyse "Procatalyse": *See—*
Brunelle, Jean-Pierre, 4,138,443, Cl. 260-672.00R.
Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See—*
Martel, Bernard G. M.; Wallerand, Philippe G. S.; and Eygret, Daniel L., 4,137,871, Cl. 123-32.0EG.
Solender, Peter E.: *See—*
Wheelwright, Robert W.; and Solender, Peter E., 4,137,810, Cl. 84-1.030.
Soler, Peter S. Urine drain. 4,137,579, Cl. 4-311.000.
Somlo, Josef: *See—*
Hari, Stefan; Rinaldi, Ernesto; and Somlo, Josef, 4,138,568, Cl. 548-305.000.
Sommer, Frederick A. Occupant weight actuated steering unlocking mechanism for wheeled vehicles and the like. 4,138,131, Cl. 280-220.000.
Sony Corporation: *See—*
Doi, Toshitada; and Iga, Akira, 4,138,694, Cl. 358-127.000.
Nakajima, Heitaro; Omura, Yoshimoto; and Kawashima, Isao, 4,138,121, Cl. 274-23.00R.
Soos, William B., to G&H Technology, Inc. Cryogenic connector. 4,138,183, Cl. 339-94.00M.
Sotapharm: *See—*
Dehais, Claude, 4,138,240, Cl. 65-280.000.
Soto, Jose P.: *See—*
Noverola, Armando V.; Soto, Jose P.; and Spickett, R. G. W., 4,138,492, Cl. 424-267.000.
Southern Elastic Corporation: *See—*
Tillman, James E., 4,137,698, Cl. 57-18.000.
Sowell, William E. Throttle control device for motorcycles and the like. 4,137,793, Cl. 74-488.000.
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., to Mead Corporation, The. Process for producing pressure-sensitive transfer sheets using novel radiation curable coatings. 4,138,508, Cl. 427-54.000.
Speelman, Jan E., to Neratoom B.V. Nuclear reactor system of the fast type. 4,138,318, Cl. 176-18.000.
Spencer, Neil E. Container formed from bags having inserts. 4,138,054, Cl. 229-23.0BT.
Sperry, Peter R.: *See—*
Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., 4,138,390, Cl. 260-45.90L.
Sperry Rand Corporation: *See—*
Webb, Bryant F., 4,137,696, Cl. 56-208.000.
Spickett, R. G. W.: *See—*
Noverola, Armando V.; Soto, Jose P.; and Spickett, R. G. W., 4,138,492, Cl. 424-267.000.
Spiegel, Raymond W.: *See—*
Robandt, William F., II; and Spiegel, Raymond W., 4,137,737, Cl. 68-134.000.
Spiegel, Samuel, to Hamilton & Spiegel, Inc. Demonstration mirror mounting. 4,138,083, Cl. 248-474.000.
Spitzer, Edward A.: *See—*
Hallock, James N.; Spitzer, Edward A.; and Wood, William D., 4,137,764, Cl. 73-178.00T.

Sports Safety, Inc.: *See*—
Hlavac, Harry F., 4,137,654, Cl. 36-119.000.
Sprung, Philip D. Stressed membrane space enclosure. 4,137,687, Cl. 52-747.000.
Square D Company: *See*—
Colwill, John A., 4,138,709, Cl. 361-180.000.
Srock, Rainer; and Ziegler, Hermann, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Process for surface painting of body parts for motor vehicles consisting of synthetic plastic material. 4,138,513, Cl. 427-371.000.
Srowig, Reinhard, to Licentia Patent-Verwaltungs GmbH. Color television cathode ray tube gun mounting. 4,138,624, Cl. 313-417.000.
Stacey, Gilbert J.: *See*—
Brittain, David R.; Brown, Edward D.; Hepworth, Walter; and Stacey, Gilbert J., 4,138,490, Cl. 424-258.000.
Stafford, Virgil M.: *See*—
Latta, Joseph E., Jr.; and Stafford, Virgil M., 4,138,668, Cl. 340-130.000.
Stahlecker, Fritz; and Loepfe, Erich, to Stahlecker, Hans; and Stahlecker, Fritz. Textile machine with devices for determination of the transverse dimension of running yarn. 4,137,699, Cl. 57-264.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz; and Loepfe, Erich, 4,137,699, Cl. 57-264.000.
Stal-Laval Turbin AB: *See*—
Halvarsson, Harald, 4,137,642, Cl. 33-179.50D.
Stamcomp, Inc.: *See*—
Midgley, Edward L., 4,138,653, Cl. 334-15.000.
Standard Oil Company, The: *See*—
Shaw, Wilfrid G.; and Terrill, David B., 4,138,366, Cl. 252-464.000.
Standard Oil Company (Indiana): *See*—
Mitchell, Philip B., 4,138,519, Cl. 428-95.000.
Puskas, Imre; and Fields, Ellis K., 4,138,392, Cl. 528-208.000.
Zaremba, Hubart B., 4,138,148, Cl. 285-317.000.
Stanik, Raimund: *See*—
Kramer, Friedhelm; Wolfertz, Gunter; Klaus, Harald; Stanik, Raimund; and Ramspott, Walter, 4,137,607, Cl. 24-95.000.
Stanley, Carlton H.: *See*—
Sumner, Joe D.; and Stanley, Carlton H., 4,138,090, Cl. 251-152.000.
Stansbury, Benjamin H., Jr.: *See*—
Kimmell, Steven D.; and Stansbury, Benjamin H., Jr., 4,138,127, Cl. 280-11.230.
Stapel, Wilhelm; Droste, Gunter; and Seiler, Klaus-Dieter, to Durkoppwerke GmbH. Gripper and bobbin assembly for double-lock-stitch sewing machine. 4,137,858, Cl. 112-181.000.
Stapleton, Earl W.; McLaughlin, Patricia A.; and Turnbaugh, Jerry E., to Tektronix, Inc. Thermal printing head. 4,138,605, Cl. 219-216.000.
Stary, Rudolf, to Swiss Aluminium Ltd. Process for the removal of impurities from aluminum melts. 4,138,245, Cl. 75-68.00R.
Statsenko, Nikolai N.; Kuzub, Vladislav S.; Moisa, Vladimir G.; and Kryzhny, Evgeny A. Apparatus for anodic protection against corrosion of metal objects in contact with electrically conductive media. 4,138,323, Cl. 204-196.000.
Stauffer Chemical Company: *See*—
Teach, Eugene G., 4,138,495, Cl. 424-274.000.
Stave, Frederick R.; and Torrington, Leslie A., to RCA Corporation. Video disc package. 4,138,703, Cl. 360-133.000.
Stearns Manufacturing Company: *See*—
Evert, Karla R., 4,137,586, Cl. 9-341.000.
Stehle, Heinz: *See*—
Janner, Karl; Gregorius, Klaus; and Stehle, Heinz, 4,138,297, Cl. 204-157.10R.
Steig, Hans. Lead accumulator. 4,138,533, Cl. 429-161.000.
Steiger, Rolf; Reber, Jean-Francois; Ezekiel, Aaron D.; and Ficken, Geoffrey E., to Ciba-Geigy AG. Spectral sensitization of photographic material and new spectral sensitizers. 4,138,551, Cl. 542-435.000.
Steinegger, Alfred: *See*—
Buxmann, Kurt; Bornand, Jean-Daniel; and Steinegger, Alfred, 4,138,246, Cl. 75-68.00R.
Steiner, Peter; and Bischoff, William F., to Foster Wheeler Energy Corporation. Regeneration flow distribution device. 4,138,020, Cl. 214-17.00C.
Sterling Drug Inc.: *See*—
Johnson, Robert E., 4,138,405, Cl. 260-326.50C.
Sterling Drugs Inc.: *See*—
Minatoya, Hiroaki; Tullar, Benjamin F.; and Conway, Walter D., 4,138,581, Cl. 560-109.000.
Stevens, Travis E.: *See*—
Emmons, William D.; and Stevens, Travis E., 4,138,545, Cl. 528-289.000.
Stewart, George L.; and Howell, Robert L. Rotary tool for stripping adhesive carpeting from flooring. 4,137,595, Cl. 15-200.000.
Stewart, Herbert M.: *See*—
Frye, Alva L.; and Stewart, Herbert M., 4,138,027, Cl. 215-13.00R.
Steyer, Chester G. Suction system for cleaning carpet and the like. 4,137,599, Cl. 15-300.00A.
Stiles, Alvin B.; and England, David C., to Du Pont de Nemours, E. I., and Company. Process for ammoxidation of 1-propanol. 4,138,430, Cl. 260-465.900.
Stock, Hugh J., to Pacer Industries, Inc. Dispenser for anaerobic and cyanoacrylate adhesives. 4,138,040, Cl. 222-420.000.
Stoll, Max: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,138,410, Cl. 260-332.20R.
Stoller, Milton: *See*—
Haverl, Ronald A.; and Stoller, Milton, 4,137,777, Cl. 73-620.000.
Stolz, Robert; and Hahn, Walter, to SKF Industries, Inc. Two row rolling bearing assembly having single piece inner ring and two piece outer ring. 4,138,169, Cl. 308-189.00R.
Stone, James D.: *See*—
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,138,244, Cl. 71-121.000.
Stone, Thomas D.; Felgen, Michael J.; and de Man, Heiko T., to Intonation Systems. Fingerboard attachment for stringed instruments. 4,137,813, Cl. 84-314.000.
Stransky, Charles E. Process for producing water and oil soluble curcumin coloring agents. 4,138,212, Cl. 8-80.000.
Strapex AG: *See*—
Fischer, Karl, 4,137,788, Cl. 74-242.900.
Strauss, Julius; Hubner, Herbert; Muller, Heinz; and Krempl, Engelbert, to Hoechst Aktiengesellschaft. Process for the preparation of tertiary aliphatic amines. 4,138,437, Cl. 260-583.00R.
Strauss, Karl M.; Geller, Harold H.; and Wagner, Bernd J., to Pabst Brewing Company. Preparation of beer with reduced calories. 4,138,499, Cl. 426-16.000.
Strickland, Edward T. Method and apparatus for producing molten glass. 4,138,238, Cl. 65-134.000.
Strong, Steven L., to General Motors Corporation. Endless belt parts transporter. 4,138,009, Cl. 198-396.000.
Suchy, Milos: *See*—
Chodnekar, Madhukar S.; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,138,579, Cl. 560-64.000.
Sudler, Roland, to Quartz-Zeit AG. Single phase stepper motor. 4,138,617, Cl. 310-49.00R.
Sugimori, Shuichi: *See*—
Sato, Hiroshi; Nakatani, Munetsugu; Nakatsui, Hiroshi; Kakita, Hideto; Shimoyama, Hiroyuki; Mochida, Naoki; and Sugimori, Shuichi, 4,138,520, Cl. 428-141.000.
Sukhraj, Sukhnandan. Scouring device. 4,137,589, Cl. 15-28.000.
Suling, Carlhans: *See*—
Lindner, Christian; Suling, Carlhans; Arend, Gunter; Brokmeier, Dieter; and Nischk, Gunther, 4,138,393, Cl. 526-287.000.
Sullivan, John L., Jr.: *See*—
Brauns, Frank; and Sullivan, John L., Jr., 4,137,856, Cl. 112-104.000.
Sumitomo Chemical Company, Limited: *See*—
Kawakami, Shigenao; Shibata, Tatsumi; Isaoka, Shin-Ichi; and Shintani, Tutomu, 4,138,446, Cl. 260-875.000.
Sumitomo Electric Industries, Ltd.: *See*—
Yokota, Minoru; and Sato, Kenichi, 4,138,275, Cl. 148-2.000.
Sumner, Joe D.; and Stanley, Carlton H. Butterfly valve with two-way pressure enhanced sealing. 4,138,090, Cl. 251-152.000.
Sun Electric Corporation: *See*—
Karlin, Richard A.; and Rim, Kirk K. O. K., 4,138,641, Cl. 324-123.00R.
Sunbeam Corporation: *See*—
Edwards, Harrison F., 4,137,896, Cl. 126-140.000.
Sundeen, Joseph E.: *See*—
Hauck, Frederic P.; Sundeen, Joseph E.; and Reid, Joyce, 4,138,497, Cl. 424-305.000.
Sundstrand Corporation: *See*—
Glennon, Timothy F.; and Faulkner, Dennis T., 4,137,721, Cl. 60-711.000.
Surrette, Roy: *See*—
Rowley, Peter C., 4,137,814, Cl. 84-322.000.
Suys, Andre R.; and Van Landeghem, Willy K., to AGFA-GEVAERT N.V. Radiation-conversion screens. 4,138,361, Cl. 252-301.330.
Suzuka Paint Manufacturing Company, Limited: *See*—
Katsurayama, Tadashi; and Nakamuro, Yoshio, 4,138,523, Cl. 428-216.000.
Suzuki, Go, to NGK Insulators, Ltd. Method of manufacturing connection-type ceramic packages for integrated circuits. 4,137,628, Cl. 29-625.000.
Suzuki, Katsuo, to Nippon Gakki Seizo Kabushiki Kaisha. Cassette ejector for tape recorder with both play and ejection inhibit. 4,138,701, Cl. 360-96.000.
Suzuki, Katsuyuki: *See*—
Sekimoto, Shigeki; and Suzuki, Katsuyuki, 4,137,936, Cl. 137-246.220.
Suzuki, Masao; and Yamajo, Tsutomu, to Bridgestone Tire Company Limited; and Japan Ships Machinery Development Association. Endless belt conveyor for collecting floating matter from water surface. 4,138,340, Cl. 210-396.000.
Suzuki, Seigo; and Uemori, Keiji, to Tokyo Shibaura Electric Co., Ltd. Data transfer control system. 4,138,732, Cl. 364-900.000.
Suzuki, Yujiro: *See*—
Mori, Etsuo; Shimiya, Keiji; Miura, Norio; and Suzuki, Yujiro, 4,138,529, Cl. 428-539.000.
Swallow, Roger T., to Rampon Products, Incorporated. Hosiery testing apparatus. 4,137,763, Cl. 73-159.000.
Swanson-Erie Corporation: *See*—
Yeo, Ernest E., 4,137,953, Cl. 141-65.000.
Swanstrom, H. Wallace; Campbell, Kenneth C.; and Schaer, Werner, to Xerox Corporation. Automatic writing systems and methods of word processing therefor. 4,138,719, Cl. 364-200.000.
Sweet, Douglas W.: *See*—
Nehmer, Carl A.; and Sweet, Douglas W., 4,138,723, Cl. 364-424.000.

Sweetheart Plastics, Inc.: *See—*
Mack, Anthony C.; and Shumrak, George K., 4,138,504, Cl. 426-520.000.

Swift, Graham: *See—*
Cenci, Harry J.; and Swift, Graham, 4,138,541, Cl. 526-303.000.

Swift, Harold E.; and Vogel, Roger F., to Gulf Research & Development. Hydrotreating process and catalyst. 4,138,326, Cl. 208-108.000.

Swift, Harold E.: *See—*
Beuther, Harold; McKinney, Joel D.; and Swift, Harold E., 4,138,325, Cl. 208-50.000.

Swiss Aluminium Ltd.: *See—*
Buxmann, Kurt; Bornand, Jean-Daniel; and Steinegger, Alfred, 4,138,246, Cl. 75-68.00R.
Stary, Rudolf, 4,138,245, Cl. 75-68.00R.

Sybron Corporation: *See—*
Nunlist, Erwin J., 4,137,669, Cl. 49-386.000.

Szpur, Roman, to Panabeam Corp. Light fixture. 4,138,713, Cl. 362-218.000.

T. I. Domestic Appliances Limited: *See—*
Longworth, Alfred, 4,137,905, Cl. 126-350.00R.

Tablett, Edward E.: *See—*
Fapiano, Donald J.; and Tablett, Edward E., 4,137,741, Cl. 72-6.000.

Tadakuma, Yuji; Saito, Syunji; and Eguchi, Toru, to Tokyo Electric Co., Ltd. Electronic cash register. 4,138,733, Cl. 364-900.000.

Tadokoro, Eiichi; Utumi, Masahiro; Fujiyama, Masaaki; and Takayama, Satoru, to Fuji Photo Film Co., Ltd. Cleaning tape for magnetic head. 4,138,229, Cl. 51-398.000.

Taglieber, Kurt: *See—*
Baur, Karl G.; Hellbach, Hans; Platz, Rolf; and Taglieber, Kurt, 4,138,591, Cl. 568-756.000.

Taimei Kinzoku Kogyo Kabushiki Kaisha: *See—*
Sekimoto, Shigeki; and Suzuki, Katsuyuki, 4,137,936, Cl. 137-246.220.

Takagi, Yasuo: *See—*
Ohira, Toshiaki; Hara, Eisuke; and Takagi, Yasuo, 4,138,271, Cl. 127-34.000.

Takahashi, Shizuo, to Tokyo Automatic Machinery Works, Ltd. Packaging machine. 4,137,691, Cl. 53-229.000.

Takara Co., Ltd.: *See—*
Ogawa, Iwakichi, 4,137,666, Cl. 46-202.000.

Takasaki, Yukio: *See—*
Ukihashi, Hiroshi; Hayashi, Takao; and Takasaki, Yukio, 4,138,417, Cl. 260-406.000.

Takata, Isao: *See—*
Chibata, Ichiro; Tosa, Tetsuya; and Takata, Isao, 4,138,292, Cl. 195-59.000.

Takayama, Satoru: *See—*
Tadokoro, Eiichi; Utumi, Masahiro; Fujiyama, Masaaki; and Takayama, Satoru, 4,138,229, Cl. 51-398.000.

Takayasu, Mitsuru: *See—*
Endoh, Takeshi; and Takayasu, Mitsuru, 4,138,059, Cl. 235-483.000.

Takeda, Keiso; and Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine secondary air injection compensating system. 4,137,713, Cl. 60-276.000.

Takeda, Keiso; and Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine secondary air supply control system. 4,137,714, Cl. 60-276.000.

Takeshima, Sadao, to Jidoshakiki Co., Ltd. Drive circuit for solenoid pump. 4,138,708, Cl. 361-156.000.

Talbert, Wayne M. Belt tension indicating apparatus. 4,137,759, Cl. 73-143.000.

Tamehiro, Hiroshi: *See—*
Nakasugi, Hajime; Masui, Hiroaki; Tamehiro, Hiroshi; and Mazuda, Hiroo, 4,138,278, Cl. 148-12.00R.

Tamura, Sadahiro: *See—*
Nishikawa, Toshio; Ishikawa, Youhei; and Tamura, Sadahiro, 4,138,652, Cl. 333-82.00R.

Tanabe Seiyaku Co., Ltd.: *See—*
Chibata, Ichiro; Tosa, Tetsuya; and Takata, Isao, 4,138,292, Cl. 195-59.000.

Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. Switching circuit. 4,138,613, Cl. 307-247.00A.

Tanifuji, Shinya; and Morooka, Yasuo, to Hitachi, Ltd. Interstand tension control method and apparatus for tandem rolling mill. 4,137,742, Cl. 72-6.000.

Taniwaki, Genshi, to Kongo Co., Ltd. Device for anchoring movable box-shaped shelf assembly. 4,138,173, Cl. 312-198.000.

Tattershall, Donald R. Freezer organizer. 4,138,175, Cl. 312-270.000.

Tavernier, Bernard H.: *See—*
Gilliams, Yvan K.; De Volder, Noel J.; Pollet, Robert J.; Tavernier, Bernard H.; De Jaeger, Nikolaas C.; and Sels, Francis J., 4,138,351, Cl. 252-62.10L.

Taylor Industries, Inc.: *See—*
Taylor, Philip W., 4,137,623, Cl. 29-433.000.

Taylor, John J., Sr. Method of forming screen packs. 4,138,303, Cl. 156-264.000.

Taylor, Morris C.: *See—*
Rhodes, John R.; Sieberg, Robert D.; Taylor, Morris C.; Westkaemper, John C.; and Young, Robert C., 4,137,751, Cl. 73-28.000.

Taylor, Philip W., to Taylor Industries, Inc. Method and apparatus for dispensing fluid in a conduit. 4,137,623, Cl. 29-433.000.

Teach, Eugene G., to Stauffer Chemical Company. N-Substituted pyrrolidones and their use as miticides. 4,138,495, Cl. 424-274.000.

Technicon Instruments Corporation: *See—*
Masson, Pierre L.; and Heremans, Joseph, deceased, 4,138,213, Cl. 23-230.00B.

Tedesco, Francis A., to Lifetime Foam Products, Inc. Production of structural members from reclaimed polyolefins. 4,138,534, Cl. 521-79.000.

Teepak, Inc.: *See—*
Bridgeford, Douglas J., 4,137,947, Cl. 138-118.100.

Teijin Limited: *See—*
Aoyama, Hideki; and Kawamoto, Koichi, 4,138,072, Cl. 242-35.50A.
Ishimoto, Sachio; Yamaguchi, Hisao; Kato, Yoshinori; Oba, Takeo; Ozawa, Kenji; Ichikawa, Yataro; Nakagawa, Koji; and Tsuruta, Hideki, 4,138,553, Cl. 544-18.000.

Tektronix, Inc.: *See—*
Stapleton, Earl W.; McLaughlin, Patricia A.; and Turnbaugh, Jerry E., 4,138,605, Cl. 219-216.000.

Teledyne Industries, Inc.: *See—*
Mullins, Keith M.; Leppert, Thomas K.; Cannon, Thomas; Kerr, Ronald R.; and Smith, Ronn G., 4,138,066, Cl. 241-86.000.

Teledyne McCormick Selph: *See—*
Goddard, Terrence P.; and Thatcher, Donald N., 4,138,282, Cl. 149-19.800.

Temple University: *See—*
Labes, Mortimer M., 4,138,358, Cl. 252-299.000.

Tenneco, Inc.: *See—*
Rutt, Paul A., 4,137,993, Cl. 181-282.000.

Teot, Arthur S.; Hamlin, Percy J.; and Savage, Albert B., to Dow Chemical Company, The. Detergent compositions with antisoil and antiredeposition properties. 4,138,352, Cl. 252-135.000.

Terada, Sadatugu: *See—*
Fushiki, Isamu; Koboshi, Sigeharu; and Terada, Sadatugu, 4,138,257, Cl. 96-60.0BF.

Teranishi, Masayuki: *See—*
Nakamizo, Nobuhiro; Teranishi, Masayuki; Matsukuma, Ikuo; Shuto, Katsuichi; and Yamada, Koji, 4,138,485, Cl. 424-248.500.

Terpay, John M. Pile surface resembling turf and method of making it. 4,138,514, Cl. 428-17.000.

Terrill, David B.: *See—*
Shaw, Wilfrid G.; and Terrill, David B., 4,138,366, Cl. 252-464.000.

Tesseract Corporation: *See—*
Benedict, Charles E., 4,137,821, Cl. 89-35.00R.
Clemens, John E., 4,137,820, Cl. 89-33.0BB.

Tew, Sydney K.: *See—*
Pauwels, Michael A.; and Tew, Sydney K., 4,138,632, Cl. 318-599.000.

Texaco Inc.: *See—*
Colvert, James H.; MacLean, John P.; Williams, Dale; and Jones, Henry B., 4,138,219, Cl. 422-144.000.
Crawford, Wheeler C., 4,138,347, Cl. 252-33.000.
Herbstman, Sheldon; Cole, Edward L.; and Estes, John H., 4,138,444, Cl. 260-683.470.
Howard, Curtis E.; Calvin, Douglas G.; and Pitts, Robert W., Jr., 4,137,968, Cl. 166-53.000.
Wilson, Raymond F.; Peck, Reese A.; Herbstman, Sheldon; and Mih, Li C., 4,138,227, Cl. 44-62.000.
Woodle, Robert A., 4,137,753, Cl. 73-53.000.

Texas Instruments Incorporated: *See—*
Hirsbrunner, Hans G.; and Goldman, Stephen B., 4,138,251, Cl. 75-234.000.

Textima AG: *See—*
Friedrich, Karl, 4,137,749, Cl. 72-449.000.

Textron Inc.: *See—*
Hanusa, Helmut G., 4,138,283, Cl. 156-77.000.
Hester, Michael L.; and Tiller, Francis E., 4,138,078, Cl. 244-137.00R.
Kedzierski, Stanley G., 4,137,609, Cl. 24-205.14A.
Moertel, George B., 4,137,608, Cl. 24-205.11R.
Scagnelli, George J., 4,137,621, Cl. 29-408.000.

Th. Goldschmidt AG: *See—*
Fock, Jurgen; Schamberg, Eckehard; and Hoffmann, Wolfgang, 4,138,450, Cl. 260-881.000.

Thal, Claude; Besselievre, Richard; Husson, Henri P.; and Potier, Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Vasodilating octahydro-1,12-methano-oxymethano[2,3-a]-indoloquinolizines. 4,138,489, Cl. 424-256.000.

Thatcher, Donald N.: *See—*
Goddard, Terrence P.; and Thatcher, Donald N., 4,138,282, Cl. 149-19.800.

Theodor Kromer KG Spezialfabrik fur Sicherheitsschlosser: *See—*
Marold, Ulrich, 4,137,738, Cl. 70-274.000.

Thewalt, Klaus: *See—*
Janssen, Paul, deceased; Meyer, Gunther; Thewalt, Klaus; and Schmidt, Reinhard, 4,138,544, Cl. 528-272.000.

Thiede, Horst: *See—*
Harmsen, Nils; Markhof, Horst; Reichelt, Walter; Schiff, Klaus-Ludwig; and Thiede, Horst, 4,138,604, Cl. 200-267.000.

Thir, Peter. Adjustable railing assembly. 4,138,094, Cl. 256-67.000.

Thomas, Arthur J.: *See—*
Dettmann, Eileen A.; and Thomas, Arthur J., 4,137,660, Cl. 40-303.000.

Thompson, H. Lytle, to UOP Inc. Dual pressure absorption process. 4,138,230, Cl. 55-48.000.

Thompson, Lowell H.; and Goplen, Arne. Rake device for removing weeds from lakes. 4,137,693, Cl. 56-8.000.

Thompson, Maynard L., to Honeywell, Inc. Battery holder for a control device. 4,138,531, Cl. 429-98.000.
Thompson, Stephen W.: *See—*
Ingle, William M.; and Thompson, Stephen W., 4,138,509, Cl. 427-86.000.
Thomson-Brandt: *See—*
Lehureau, Jean-Claude; and Oprandi, Pierre, 4,138,663, Cl. 340-146.30F.
Thomson-CSF: *See—*
Girault, Herve; and Colas, Daniel, 4,138,726, Cl. 364-521.000.
Huignard, Jean-Pierre; Herriau, Jean-Pierre; and Micheron, Francois, 4,138,189, Cl. 350-3.640.
Thor Borresen: *See—*
Borresen, Thor; and Harder, Niels U., 4,138,526, Cl. 428-419.000.
Thornburgh, William F., to General Motors Corporation. Emission control system with altitude compensated purge valve. 4,137,882, Cl. 123-136.000.
Tieszen, Dale O.: *See—*
Marrs, Oren L.; Reusser, Robert E.; and Tieszen, Dale O., 4,138,516, Cl. 428-36.000.
Tigner, Reuben A., to Cordis Dow Corp. Method for forming tubesheets on hollow fiber tows and forming hollow fiber bundle assemblies containing same. 4,138,460, Cl. 264-159.000.
Tiller, Francis E.: *See—*
Hester, Michael L.; and Tiller, Francis E., 4,138,078, Cl. 244-137.00R.
Tillman, James E., to Southern Elastic Corporation. Method and apparatus for winding covered yarn. 4,137,698, Cl. 57-18.000.
Titus, Theodore, IV: *See—*
Bolick, Fred C., Jr.; Titus, Theodore, IV; and Mohammadioun, Said, 4,138,695, Cl. 360-92.000.
Toberg, Lloyd H. Wood incisor. 4,137,956, Cl. 144-2.00J.
Tobler, Erich: *See—*
Chan, John K.; Tobler, Erich; and Johnson, Herbert E., 4,138,422, Cl. 260-453.0RW.
Toke, Ronald J.; and Donze, William A., to Allen-Bradley Company. Numerical control system with downloading capability. 4,138,718, Cl. 364-200.000.
Tokico Ltd.: *See—*
Okada, Kenji, 4,138,042, Cl. 222-529.000.
Tokyo Automatic Machinery Works, Ltd.: *See—*
Takahashi, Shizuo, 4,137,691, Cl. 53-229.000.
Tokyo Electric Co., Ltd.: *See—*
Tadakuma, Yuji; Saito, Syunji; and Eguchi, Toru, 4,138,733, Cl. 364-900.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Kawauchi, Yasunobu, 4,138,724, Cl. 364-500.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Koizumi, Hisao; Kawada, Yoshinosuke; Murasaki, Hiroaki; and Hisaoka, Satoshi, 4,137,898, Cl. 126-270.000.
Nawa, Keiji; and Iwasaki, Masami, 4,138,690, Cl. 357-46.000.
Niwa, Kazuo, 4,138,306, Cl. 156-345.000.
Suzuki, Seigo; and Uemori, Keiji, 4,138,732, Cl. 364-900.000.
Toray Industries, Inc.: *See—*
Motegi, Masahiko; Fujita, Saburo; Okabe, Kazuo; Miura, Yasuki; and Minami, Satoyuki, 4,138,386, Cl. 260-40.00R.
Nogi, Tatsuo; Yoshizawa, Yasuo; Kashihara, Kanzi; Yoshizumi, Nobuo; and Tsuda, Yoshizo, 4,138,445, Cl. 260-844.000.
Torigian, Puzant C. Multi-layer tray dispenser package. 4,138,052, Cl. 229-17.00B.
Torrington, Leslie A.: *See—*
Stave, Frederick R.; and Torrington, Leslie A., 4,138,703, Cl. 360-133.000.
Tosa, Tetsuya: *See—*
Chibata, Ichiro; Tosa, Tetsuya; and Takata, Isao, 4,138,292, Cl. 195-59.000.
Toyo Kogyo Co., Ltd.: *See—*
Kageyama, Gengo; and Kamite, Junji, 4,137,879, Cl. 123-119.00A.
Kurio, Niroyuki, 4,138,124, Cl. 277-81.00P.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Noro, Shuhei; Hayashi, Kunio; and Wada, Yoshisada, 4,137,674, Cl. 51-281.00R.
Takeda, Keiso; and Miyagi, Hideo, 4,137,713, Cl. 60-276.000.
Takeda, Keiso; and Miyagi, Hideo, 4,137,714, Cl. 60-276.000.
Tracy, David J.; and Hoffstadt, Walter F., to GAF Corporation. Nitrophenyl imino propionates. 4,138,571, Cl. 560-22.000.
Travenol Laboratories, Inc.: *See—*
Killman, Don M.; and Robinson, Thomas P., 4,137,916, Cl. 128-214.400.
Treick, Roger E.: *See—*
Crews, Donald R.; Davis, Billy J.; Treick, Roger E.; and Wellauer, John C., 4,137,982, Cl. 180-68.00R.
Trevoy, Lloyd W.: *See—*
Kaminsky, Victor; Trevoy, Lloyd W.; and Maskwa, Alvin, 4,138,467, Cl. 423-74.000.
Triangle Biomedical Equipment, Inc.: *See—*
Pickett, John E. P.; and Franklin, Burton P., 4,137,631, Cl. 30-337.000.
Trias, John A.: *See—*
Hammond, Peter R.; Schimitschek, Erhard J.; and Trias, John A., 4,138,401, Cl. 546-89.000.
Trio Kabushiki Kaisha: *See—*
Muratsuka, Hiroshi, 4,138,182, Cl. 339-89.00M.
Trout, Philip A., to United States of America, Navy. Electronic thermostat. 4,137,770, Cl. 73-362.0AR.
Tru-Spoke, Inc.: *See—*
Lohmeyer, Kurt W., 4,138,160, Cl. 301-108.00S.
Trumper, Mark A., to Grain Systems, Inc. Floor system for grain bin. 4,137,682, Cl. 52-303.000.
Truscheit, Ernst; Bierling, Robert; Schlumberger, Horst D.; and Oettgen, Herbert F., to Bayer Aktiengesellschaft. Process for the preparation of immunopotentiating agents from components of yeast cell wall material. 4,138,479, Cl. 424-88.000.
TRW Inc.: *See—*
Culpepper, Jesse L., 4,137,933, Cl. 137-219.000.
Tsai, James T.: *See—*
Colombo, Edward A.; Johnson, David E.; and Tsai, James T., 4,137,754, Cl. 73-56.000.
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makoto; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, to Mitsubishi Denki Kabushiki Kaisha. Method of lighting for colored shadows. 4,138,714, Cl. 362-231.000.
Tsuda, Kiyoshi: *See—*
Shibata, Akira; Miyazaki, Yukio; Tsuda, Kiyoshi; Otake, Noboru; and Kinashi, Haruyasu, 4,138,496, Cl. 424-283.000.
Tsuda, Yoshizo: *See—*
Nogi, Tatsuo; Yoshizawa, Yasuo; Kashihara, Kanzi; Yoshizumi, Nobuo; and Tsuda, Yoshizo, 4,138,445, Cl. 260-844.000.
Tsujii, Yasuhiro: *See—*
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Nagatani, Kuniaki; and Nishimura, Shigeyuki, 4,138,436, Cl. 260-581.000.
Tsukuru, Mizoguchi. Ignition device. 4,138,710, Cl. 361-263.000.
Tsuruta, Hideki: *See—*
Ishimoto, Sachio; Yamaguchi, Hisao; Kato, Yoshinori; Oba, Takeo; Ozawa, Kenji; Ichikawa, Yataro; Nakagawa, Koji; and Tsuruta, Hideki, 4,138,553, Cl. 544-18.000.
Tucker, Benjamin W.: *See—*
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,138,398, Cl. 260-239.30R.
Tullar, Benjamin F.: *See—*
Minatoya, Hiroaki; Tullar, Benjamin F.; and Conway, Walter D., 4,138,581, Cl. 560-109.000.
Tully, Daniel F. Inverted, doubly-curved umbrella, hyperbolic paraboloid shells with structurally integrated upper diaphragm. 4,137,679, Cl. 52-73.000.
Tummes, Hans; Noeske, Heinz; Cornils, Boy; and Kascha, Waldemar, to Ruhrchemie Aktiengesellschaft. Process for the improved manufacture of 2-ethylhexanol. 4,138,588, Cl. 568-881.000.
Tung, Joseph S., to International Business Machines Corporation. Electronic tachometer with variable bandwidth differentiator. 4,138,728, Cl. 364-565.000.
Tung-lung, Ho; and Ping-ho, Lin. Fog smoke-filtrating and muffling device utilized by vehicle. 4,137,715, Cl. 60-310.000.
Tungum Company Limited, The: *See—*
Lawrence, Anthony J., 4,138,145, Cl. 285-23.000.
Tuppen, Arthur R.: *See—*
De Lorme, James F.; and Tuppen, Arthur R., 4,138,680, Cl. 343-105.00R.
Turetsky, Isadore. Filter-purifier cartridge having separable elements. 4,138,339, Cl. 210-337.000.
Turnbaugh, Jerry E.: *See—*
Stapleton, Earl W.; McLaughlin, Patricia A.; and Turnbaugh, Jerry E., 4,138,605, Cl. 219-216.000.
Turner, Robert B., to Johnson & Johnson. Variable slope temperature transducer. 4,138,616, Cl. 307-310.000.
Turner, Warren H., to PPG Industries, Inc. Method of making flat glass with lower sulfur-containing emissions. 4,138,235, Cl. 65-27.000.
Tushie, David R.; and Myhre, Douglas C., to Rosemount Inc. Adjustable depth thermowell. 4,137,768, Cl. 73-343.00R.
Tylko, Jozef K.: *See—*
Heanley, Charles P.; Tylko, Jozef K.; and Page, David G. S., 4,137,866, Cl. 118-106.000.
Tyree, Lewis, Jr. Direct contact CO_2 cooling. 4,137,723, Cl. 62-64.000.
Ube Industries, Ltd.: *See—*
Umemura, Sumio; Matsui, Kanenobu; Ikeda, Yoshinari; and Masunaga, Katsuro, 4,138,580, Cl. 560-81.000.
Yamasaki, Toshiharu; Eguchi, Masao; Uchiumi, Schinichiro; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, 4,138,587, Cl. 560-204.000.
Uchiumi, Schinichiro: *See—*
Yamasaki, Toshiharu; Eguchi, Masao; Uchiumi, Schinichiro; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, 4,138,587, Cl. 560-204.000.
Ucovich, John N.: *See—*
Edison, David M.; Marton, Fred S.; and Ucovich, John N., 4,138,669, Cl. 340-147.00R.
Ueda, Shigeru; Makino, Kazuo; Nakata, Yoshinori; Hasegawa, Yoshihisa; Yokoyama, Shinichi; Yoshida, Ryoichi; Maekawa, Yousuke; and Yoshida, Yuji, to Agency of Industrial Science & Technology. Method for discharging high-pressure gas-occluding liquid and device therefor. 4,138,035, Cl. 222-1.000.
Ueda, Yoichi: *See—*
Unotoro, Tomoyuki; Ueda, Yoichi; Shirouchi, Yasunari; Yamashita, Hideo; Sato, Sei; and Murase, Kenji, 4,138,626, Cl. 315-169.400.
Uemori, Keiji: *See—*
Suzuki, Seigo; and Uemori, Keiji, 4,138,732, Cl. 364-900.000.
Uffner, Melville W.; Jefferson, Donald E.; Coe, Charles G.; and Beitchman, Burton D., to Air Products and Chemicals, Inc. Substituted

acetylacetonate cobaltic promoters for unsaturated polyester resin. 4,138,385, Cl. 260-40.00R.
Uibel, Paul-Ulrich, to Vorwerk & Co. Interholding GmbH. Cooking and mixing device for household purposes. 4,137,834, Cl. 99-348.000.
Ukihashi, Hiroshi; Asawa, Tatsuro; Yamabe, Masaaki; and Miyake, Haruhisa, to Asahi Glass Company Ltd. Process for producing fluorinated copolymer having ion-exchange groups. 4,138,373, Cl. 521-38.000.
Ukihashi, Hiroshi; Hayashi, Takao; and Takasaki, Yukio, to Asahi Glass Company, Ltd. Process for producing perfluorocarboxylic acid. 4,138,417, Cl. 260-406.000.
Ulrich, Henri: *See*—
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,138,398, Cl. 260-239.30R.
Ulrich, Richard D.; Maples, Crill; and Schafer, Howard C., to United States of America, Navy. Simulation oven. 4,137,966, Cl. 165-30.000.
UMC Industries, Inc.: *See*—
Cox, Robert N.; and Bodoh, Albinus G., 4,138,174, Cl. 312-333.000.
Umemura, Sumio; Matsui, Kanenobu; Ikeda, Yoshinari; and Masunaga, Katsuro, to Ube Industries, Ltd. Process for preparing diesters of dicarboxylic acids. 4,138,580, Cl. 560-81.000.
Union Carbide Corporation: *See*—
Calvert, William L.; and Fisher, James R., 4,138,163, Cl. 302-52.000.
Chan, John K.; Tobler, Erich; and Johnson, Herbert E., 4,138,422, Cl. 260-453.0RW.
D'Silva, Themistocles D. J., 4,138,423, Cl. 260-453.0RW.
Prokai, Bela; and Kanner, Bernard, 4,138,391, Cl. 260-465.600.
Schulz, David A., 4,138,525, Cl. 428-367.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Briscall, Harry, 4,137,950, Cl. 138-172.000.
United States Borax & Chemical Corporation: *See*—
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,138,244, Cl. 71-121.000.
U.S. Divers Co.: *See*—
Wright, William M., III, 4,137,585, Cl. 9-314.000.
United States of America
Army: *See*—
Beauchamp, Aaron C., 4,137,893, Cl. 124-72.000.
Glaski, Fred A., 4,138,512, Cl. 427-237.000.
Kerr, John L., 4,138,684, Cl. 343-846.000.
Kovacs, Austin, 4,137,757, Cl. 73-860.000.
Loomis, Jester M., III, 4,137,819, Cl. 89-1.813.
Miller, Donald, 4,137,761, Cl. 73-150.00A.
Pardes, Herman; Sherburne, Frederick B.; and Schwartz, Joseph R., 4,137,651, Cl. 35-25.000.
Redman, Charles M., 4,138,196, Cl. 356-350.000.
Sinclair, Robert O., Jr., 4,138,677, Cl. 343-8.000.
Energy: *See*—
Goodman, Ronald K.; and Hunt, Angus L., 4,138,609, Cl. 250-396.00R.
Grantz, Alan L., 4,138,320, Cl. 176-86.00R.
McCormick, J. Byron; Depp, Steven W.; Hamilton, Douglas J.; and Kerwin, William J., 4,138,622, Cl. 313-306.000.
Porter, Gary D.; and Bogdanoff, Anatoly, 4,138,317, Cl. 176-1.000.
Health, Education and Welfare: *See*—
McCarthy, Charles J., 4,138,089, Cl. 251-61.000.
Interior: *See*—
Pahlman, John E.; and Khalafalla, Sanna E., 4,138,465, Cl. 423-49.000.
Navy: *See*—
Cunha, Daniel, 4,137,848, Cl. 102-49.500.
Donner, Egon F., 4,137,850, Cl. 102-215.000.
Fatemi, Mohammad, 4,138,082, Cl. 248-419.000.
Hacker, John R.; Krohne, Chris W.; and Miller, William H., 4,138,181, Cl. 339-45.00R.
Hammond, Peter R.; Schimitschek, Erhard J.; and Trias, John A., 4,138,401, Cl. 546-89.000.
Hill, Robert D., 4,138,660, Cl. 340-16.00R.
Holzman, Allen L., 4,137,712, Cl. 60-251.000.
Hontgas, Christopher P.; and Smith, Benjamin D., 4,137,849, Cl. 102-56.00R.
McKinlay, James R., 4,138,615, Cl. 307-293.000.
Miller, Barry E.; McClain, D. Wayne; and McCrory, William W., Jr., 4,138,178, Cl. 339-15.000.
Simonson, Lloyd G.; and Lamberts, Burton L., 4,138,476, Cl. 424-50.000.
Trout, Philip A., 4,137,770, Cl. 73-362.0AR.
Ulrich, Richard D.; Maples, Crill; and Schafer, Howard C., 4,137,966, Cl. 165-30.000.
Transportation: *See*—
Hallock, James N.; Spitzer, Edward A.; and Wood, William D., 4,137,764, Cl. 73-178.00T.
Rudis, Robert P.; and Ceccon, Harry L., 4,137,776, Cl. 73-611.000.
U.S. Philips Corporation: *See*—
Breed, Dirk J.; Voermans, Antonius B.; and Logmans, Hans, 4,138,530, Cl. 428-539.000.
United Technologies Corporation: *See*—
Boucher, Raymond R.; and Metcalfe, Robert A., 4,138,096, Cl. 266-240.000.
Preti, Edmond; and Ripy, Howard W., 4,137,710, Cl. 60-223.000.
Universal Bricklaying Systems Pty. Ltd.: *See*—
Dietrich, Johann, 4,137,636, Cl. 33-85.000.
University of Minnesota, The Regents of the: *See*—
Vince, Robert, 4,138,562, Cl. 544-326.000.
University of Strathclyde: *See*—
Barnes, David; and Metters, Champa H., 4,138,322, Cl. 204-195.00H.
University of Toronto, The Governing Council of the: *See*—
French, John B.; Reid, Neil M.; and Buckley, Janette A., 4,137,750, Cl. 73-23.000.
University of Utah: *See*—
Shaikh, Mohammed N.; Cutler, Ivan B.; Virkar, Anil V.; and Gordon, Ronald S., 4,138,455, Cl. 264-56.000.
Unland, Herbert: *See*—
Kettner, Roland; and Unland, Herbert, 4,138,468, Cl. 423-228.000.
Uno, Shigeo: *See*—
Kato, Akira; Matsuda, Shimpei; Uno, Shigeo; Imahashi, Jinichi; Watanabe, Yoshihisa; Imanari, Makoto; and Nakajima, Fumito, 4,138,469, Cl. 423-239.000.
Unotoro, Tomoyuki; Ueda, Yoichi; Shirouchi, Yasunari; Yamashita, Hideo; Sato, Sei; and Murase, Kenji, to Fujitsu Limited. Gas discharge display apparatus. 4,138,626, Cl. 315-169.400.
Unruh, Jerry D.; and Wells, William J., III, to Celanese Corporation. Hydroformylation catalysts. 4,138,420, Cl. 260-439.0CY.
UOP Inc.: *See*—
Kubesa, Frantisek, 4,138,234, Cl. 55-374.000.
Scott, Norman H., 4,138,327, Cl. 208-146.000.
Thompson, H. Lytle, 4,138,230, Cl. 55-48.000.
Updike, Stuart J., to Wisconsin Alumni Research Foundation. Method and device for immunoassay. 4,138,474, Cl. 424-1.000.
Upjohn Company, The: *See*—
Bundy, Gordon L.; and Nelson, Norman A., 4,138,573, Cl. 560-55.000.
Bundy, Gordon L.; and Nelson, Norman A., 4,138,575, Cl. 560-55.000.
Bundy, Gordon L.; and Nelson, Norman A., 4,138,576, Cl. 560-55.000.
Bundy, Gordon L.; and Nelson, Norman A., 4,138,577, Cl. 560-55.000.
Bundy, Gordon L., 4,138,578, Cl. 560-55.000.
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Yamasaki, Toshiharu; Eguchi, Masao; Uchiumi, Schinichiro; Nishihira, Keigo; Yamashita, Masayoshi; and Itatani, Hiroshi, to Ube Industries, Ltd. Process for the preparation of dialkyl oxalates. 4,138,587, Cl. 560-204.000.
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Yamasita, Nobuo, to Olympus Optical Company. Foward-oblique viewing optical system. 4,138,192, Cl. 350-25.000.
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Yelloz, Roni P. Combination espresso and aromatic coffee maker. 4,137,833, Cl. 99-293.000.
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Yokota, Minoru; and Sato, Kenichi, to Sumitomo Electric Industries, Ltd. Method of manufacturing aluminum alloy for electric conductor. 4,138,275, Cl. 148-2.000.
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Zaremba, Hubart B., to Standard Oil Company (Indiana). Split-ring riser latch. 4,138,148, Cl. 285-317.000.
Zaydel, Wieslaw S., to General Motors Corporation. Self-locking knob and stud assembly. 4,137,959, Cl. 151-27.000.
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Zepeda-Castillo, Enrique, deceased; and by Vda. de Zepeda, Isaura N., executrix. Process for the obtention of fructose and fructose-rich syrups from xerophyte plants. 4,138,272, Cl. 127-37.000.
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Ziehm, Kurt F., Jr. Desalination apparatus. 4,138,293, Cl. 202-180.000.
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Zinevich, Vladimir D.; Yarmolenko, Georgy Z.; Sinyavsky, Vladimir S.; Romanenko, Nikolai T.; and Nikitin, Jury F. Gear-type positive-displacement machine. 4,138,206, Cl. 418-153.000.
Zint, Howard D.: *See—*
Capo, James L.; and Zint, Howard D., 4,138,041, Cl. 222-456.000.
Ziolko, Francis J., to Devro, Inc. Method of making a tubular collagen casing. 4,138,503, Cl. 426-514.000.
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Zumbach, Heinz, to Zumbach Electronic AG. Device for the measurement of the wall thickness of tubes. 4,137,639, Cl. 33-147.00L.
Zurn Industries, Inc.: *See—*
Brugger, Richard D.; and Barna, Joseph A., 4,138,608, Cl. 235-92.0FL.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 6TH DAY OF FEBRUARY, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Akiyama, Yoshinori; Ouki, Masami; and Suzuki, Masatosi, to Nippondenso Co., Ltd. Oxygen concentration detector. T979,002, 2-6-79, Cl. 204-195.00S.

Edmonds, Harold D., to International Business Machines Corporation. Light emitting diodes with back-side emission. T979,005, 2-6-79, Cl. 357-17.000.

Gamble, Roger L.: *See*—
Ogul, James E.; and Gamble, Roger L., T979,007, Cl. 364-900.000.

Graham, James L. Interlayer enhancement of interimage effects. T979,001, 2-6-79, Cl. 96-74.000.

Hadamard, Denise L., administratrix: *See*—
Hadamard, Gilbert, deceased; and Hadamard, Denise L., administratrix, T979,006, Cl. 357-23.000.

Hadamard, Gilbert, deceased; and by Hadamard, Denise L., administratrix. Trapezoidal gate FET device. T979,006, 2-6-79, Cl. 357-23.000.

International Business Machines Corporation: *See*—
Edmonds, Harold D., T979,005, Cl. 357-17.000.

Jamieson, Norman C., to Mallinckrodt, Inc. Method for preparing N-(carboxyethyl-p-aminophenol. T979,003, 2-6-79, Cl. 562-452.000.

Jamieson, Norman C., to Mallinckrodt, Inc. N,N-bis-(2-carboxyethyl)-aminophenols. T979,004, 2-6-79, Cl. 562-452.000.

Mallinckrodt, Inc.: *See*—
Jamieson, Norman C., T979,003, Cl. 562-452.000.
Jamieson, Norman C., T979,004, Cl. 562-452.000.

Nippondenso Co., Ltd.: *See*—
Akiyama, Yoshinori; Ouki, Masami; and Suzuki, Masatosi, T979,002, Cl. 204-195.00S.

Ogul, James E.; and Gamble, Roger L., to United States of America, Energy. Energy cost calculator. T979,007, 2-6-79, Cl. 364-900.000.

Ouki, Masami: *See*—
Akiyama, Yoshinori; Ouki, Masami; and Suzuki, Masatosi, T979,002, Cl. 204-195.00S.

Pezzoli, Paul A. Asbestos treatment with metal orthophosphates. T979,008, 2-6-79, Cl. 427-215.000.

Suzuki, Masatosi: *See*—
Akiyama, Yoshinori; Ouki, Masami; and Suzuki, Masatosi, T979,002, Cl. 204-195.00S.

Energy: *See*—
Ogul, James E.; and Gamble, Roger L., T979,007, Cl. 364-900.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF FEBRUARY, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Cyanamid Company: *See*—
Kirby, Jane P.; and Borders, Donald B., Re. 29,903, Cl. 536-17.000.

Ball Corporation: *See*—
Wheeler, Richard A., Re. 29,898, Cl. 220-90.400.

Borders, Donald B.: *See*—
Kirby, Jane P.; and Borders, Donald B., Re. 29,903, Cl. 536-17.000.

Busch, Norbert: *See*—
Mauvernay, Roland Y.; Busch, Norbert; Molleyre, Jacques; Simond, Jacques; and Monteil, Andre, Re. 29,902, Cl. 424-272.000.

Centre Europeen de Recherches Mauvernay: *See*—
Mauvernay, Roland Y.; Busch, Norbert; Molleyre, Jacques; Simond, Jacques; and Monteil, Andre, Re. 29,902, Cl. 424-272.000.

Feinberg, Irving: *See*—
Heine, Henry; and Feinberg, Irving, Re. 29,897, Cl. 70-71.000.

Heine, Henry; and Feinberg, Irving, to Presto Lock Company, Division of Walter Kidde & Comany, Inc. Latching device. Re. 29,897, Cl. 70-71.000.

Kennametal Inc.: *See*—
Kniff, Thomas B., deceased, Re. 29,900, Cl. 299-86.000.

Kirby, Jane P.; and Borders, Donald B., to American Cyanamid Company. Antibacterial antibiotics AM31α, AM31β and AM31γ. Re. 29,903, Cl. 536-17.000.

Kniff, Servia B., executrix: *See*—
Kniff, Thomas B., deceased, Re. 29,900, Cl. 299-86.000.

Kniff, Thomas B., deceased (by Kniff, Servia B., executrix), to Kennametal Inc. Pick-type mining bit with support block having rotatable seat. Re. 29,900, Cl. 299-86.000.

Mauvernay, Roland Y.; Busch, Norbert; Molleyre, Jacques; Simond, Jacques; and Monteil, Andre, to Centre Europeen de Recherches Mauvernay. 6-Aryloxy-2-oxo-1-aza-4-oxo (or thia)-spiro[4,5]decanes as CNS stimulants. Re. 29,902, Cl. 424-272.000.

Molleyre, Jacques: *See*—
Mauvernay, Roland Y.; Busch, Norbert; Molleyre, Jacques; Simond, Jacques; and Monteil, Andre, Re. 29,902, Cl. 424-272.000.

Monteil, Andre: *See*—
Mauvernay, Roland Y.; Busch, Norbert; Molleyre, Jacques; Simond, Jacques; and Monteil, Andre, Re. 29,902, Cl. 424-272.000.

Ninomiya, Michikazu: *See*—
Wada, Masahiro; Yanagisawa, Isao; Ninomiya, Michikazu; and Ohara, Takashi, Re. 29,901, Cl. 252-443.000.

Nippon Piston Ring Co., Ltd.: *See*—
Taniguchi, Isao, Re. 29,899, Cl. 277-235.00R.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Wada, Masahiro; Yanagisawa, Isao; Ninomiya, Michikazu; and Ohara, Takashi, Re. 29,901, Cl. 252-443.000.

Ohara, Takashi: *See*—
Wada, Masahiro; Yanagisawa, Isao; Ninomiya, Michikazu; and Ohara, Takashi, Re. 29,901, Cl. 252-443.000.

Presto Lock Company, Division of Walter Kidde & Comany, Inc.: *See*—
Heine, Henry; and Feinberg, Irving, Re. 29,897, Cl. 70-71.000.

Simond, Jacques: *See*—
Mauvernay, Roland Y.; Busch, Norbert; Molleyre, Jacques; Simond, Jacques; and Monteil, Andre, Re. 29,902, Cl. 424-272.000.

Taniguchi, Isao, to Nippon Piston Ring Co., Ltd. Chrome insert ring. Re. 29,899, Cl. 277-235.00R.

Wada, Masahiro; Yanagisawa, Isao; Ninomiya, Michikazu; and Ohara, Takashi, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Catalyst for producing unsaturated carboxylic acids. Re. 29,901, Cl. 252-443.000.

Wheeler, Richard A., to Ball Corporation. Self-sealing container closure. Re. 29,898, Cl. 220-90.400.

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LIST OF PLANT PATENTEES

Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA": *See*—
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Gessellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA": *See*—
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Holtkamp, Hermann, Sr. Anthurium plant. 4,375, 2-6-79, Cl. 88.000.
Holtkamp, Hermann, Sr. Anthurium plant. 4,376, 2-6-79, Cl. 88.000.
Holtkamp, Reinhold, to Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA". African violet plant. 4,373, 2-6-79, Cl. 69.000.
Holtkamp, Reinhold, to Gessellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA". African violet plant. 4,374, 2-6-79, Cl. 69.000.

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American Thermometer Co., Inc.: *See*—
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Amezcua, Saul O. Nasal device. 251,017, 2-6-79, Cl. D24-99.000.
Anchor Hocking Corporation: *See*—
Thrush, James L., 250,986, Cl. D7-15.000.
Armstrong, Nolen L. Pillow. 250,985, 2-6-79, Cl. D6-201.000.
Arvey Corporation: *See*—
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Aul, Robert J.; Breno, Philip J.; Zitkus, Wayne J.; Watson, Barry; and Maguire, Paul R., to Owens-Illionis, Inc. Urea nitrogen analyzer. 251,014, 2-6-79, Cl. D24-21.000.
Ball Corporation: *See*—
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Bonair Boats, Inc.: *See*—
Smith, Burks A., Jr.; and Smith, Wayne G., 251,032, Cl. D34-42.000.
Brady, John F., to Felt Products Mfg. Co. Roadway expansion joint sealing retainer extrusion. 251,019, 2-6-79, Cl. D25-74.000.
Breece, William N. Volume reduction scale. 250,998, 2-6-79, Cl. D10-71.000.
Breger, Carl-Arne, to Telefonaktiebolaget L M Ericsson. Telephone instrument. 251,005, 2-6-79, Cl. D14-53.000.
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Bubash, Tony. Polygonal speaker enclosure. 251,004, 2-6-79, Cl. D14-33.000.
Burgoon, Jack L., to Scott & Fetzer Company, The. Floor machine. 251,007, 2-6-79, Cl. D15-50.000.
Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Bakery tray or the like. 251,034, 2-6-79, Cl. D87-1.00R.
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Chasen, Lee R., to Coats & Clark, Inc. Wall hook. 250,992, 2-6-79, Cl. D8-367.000.
Chasen, Lee R., to Coats & Clark, Inc. Wall hook. 250,993, 2-6-79, Cl. D8-367.000.
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Chasen, Lee R., 250,992, Cl. D8-367.000.
Chasen, Lee R., 250,993, Cl. D8-367.000.
Chasen, Lee R., 250,994, Cl. D8-367.000.
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Cruger, Nicholas A. Golf putter head. 251,027, 2-6-79, Cl. D34-5.0GH.
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Excel Sound Corporation: *See*—
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Forselius, Frank. Combined vehicular radio mounting and snack tray. 251,001, 2-6-79, Cl. D12-155.000.
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Glaser, Harold, to James David Incorporated. Seat. 250,979, 2-6-79, Cl. D6-73.000.
Glaser, Harold, to James David Incorporated. Seat. 250,980, 2-6-79, Cl. D6-73.000.
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Hanneman, Robert H.; and Grandy, Kenneth N., to Master Lock Company. Key. 250,990, 2-6-79, Cl. D8-347.000.
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Glaser, Harold, 250,980, Cl. D6-73.000.
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Kettel, Stanley. Disposable loop and collector for transferring biological samples. 251,013, 2-6-79, Cl. D24-8.000.
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McKay, Nicholas D., to Helmac Products Corporation. Grooming brush for pets. 251,022, 2-6-79, Cl. D30-40.000.
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O'Connor, David A., to Virginia National Bankshares, Inc. Support for use with electronic computer units. 250,981, 2-6-79, Cl. D6-85.000.
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Ohtomo, Kazuhito, to Sansui Electric Co., Ltd. Tone arm. 251,003, 2-6-79, Cl. D14-27.000.
Okada, Masao, to Excel Sound Corporation. Cleaning arm for phonograph records. 251,002, 2-6-79, Cl. D14-25.000.
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Thrush, James L., to Anchor Hocking Corporation. Tumbler or similar article. 250,986, 2-6-79, Cl. D7-15.000.
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CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 6, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

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4 : 4,138,248	4,137,904	4,138,615	4,138,139	4,138,566	4,138,116
6 : 4,137,654	4,137,907	4,138,627	4,138,152	4,138,636	4,138,220
4,137,709	4,137,913	4,138,635	4,138,159	4,138,641	4,138,308
4,137,719	4,137,929	4,138,648	4,138,178	4,138,643	4,138,354
4,137,720	4,137,930	4,138,649	4,138,202	4,138,653	4,138,498
4,137,724	4,137,931	4,138,651	4,138,517	4,138,664	4,138,637
4,137,848	4,137,965	4,138,671	4,138,678	4,138,670	4,138,661
4,137,850	4,137,974	4,138,720	13 : 4,137,793	4,138,673	4,138,686
4,137,863	4,137,984	4,138,728	4,137,844	4,138,681	4,138,722
4,138,038	4,137,986	4,138,736	4,138,033	4,138,706	4,138,730
4,138,057	4,137,987	4,138,739	4,138,519	4,138,716	4,138,737
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4,138,197	4,138,103	4,137,656	4,138,505	4,138,021	4,137,764
4,138,660	4,138,108	4,137,683	17 : 4,137,604	4,138,029	4,137,766
4,138,721	4,138,119	4,137,777	4,137,660	4,138,049	4,137,776
8 : 4,137,818	4,138,127	4,137,804	4,137,682	4,138,063	4,137,838
9 : 4,137,755	4,138,140	4,137,805	4,137,721	4,138,129	4,137,953
4,138,682	4,138,160	4,138,104	4,137,723	4,138,181	4,137,964
01 : 4,137,819	4,138,172	4,138,185	4,137,744	4,138,249	4,137,996
4,137,977	4,138,177	4,138,187	4,137,795	4,138,537	4,138,006
4,138,218	4,138,183	4,138,290	4,137,796	4,138,628	4,138,051
4,138,631	4,138,186	4,138,350	4,137,852	4,138,703	4,138,055
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4,137,878	4,138,203	4,138,399	4,137,892	4,137,813	4,138,251
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4,138,594	4,138,222	4,138,563	4,137,944	20 : 4,137,591	4,138,447
05 : 4,138,135	4,138,223	4,138,597	4,137,947	4,137,853	4,138,456
06 : 4,137,573	4,138,224	4,138,612	4,137,982	4,137,900	4,138,504
4,137,577	4,138,238	4,138,672	4,137,983	4,137,925	4,138,528
4,137,579	4,138,244	4,138,735	4,138,004	4,138,023	4,138,616
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4,137,769	4,138,344	4,137,595	4,138,161	24 : 4,137,671	4,137,815
4,137,784	4,138,383	4,137,662	4,138,191	4,137,672	4,137,828
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4,137,846	4,138,464	4,137,821	4,138,356	4,137,917	4,137,891
4,137,855	4,138,495	4,137,856	4,138,362	4,137,999	4,137,959
4,137,864	4,138,512	4,137,903	4,138,384	4,138,044	4,137,960
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